



# Vinyl 2010

## The Voluntary Commitment of the PVC industry



October 2001

Vinyl 2010 – Key milestones of the Voluntary Commitment of the PVC industry

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>Management</b>	Publication of 1st annual report in April	Set up of legal entity			Revision of objectives					Definition of new objectives
<b>Production</b>		Compliance audit on VCM / Suspension PVC Charter	Compliance deadline for Emulsion PVC Charter (Dec.)	Compliance audit on Emulsion PVC Charter						
<b>Additives</b>	End of Cd stabilisers sales in the EU (March)	Completion of Phthalates risk-assessment (EU process)		Completion of initial risk-assessment on lead stabilisers	15% reduction target of use of lead stabilisers					50% reduction target of use of lead stabilisers (100% by 2015)
<b>Waste management</b>										
<b>recycling targets</b>	Technical and feasibility studies		25% recycling of pipes and window profiles 25% recycling of roofing membranes		50% recycling of pipes and window profiles 50% recycling of roofing membranes	25% recycling of flooring		50% recycling of flooring		Total recycling of 200 000 additional tons post-consumer PVC waste
<b>New technologies - Research &amp; Development</b>		Development of solvent-based technology for cables and coated fabric (2002/2003) Evaluation of the results of Linde gasification technology pilot plant (2002)								

## Executive Summary

**Vinyl 2010 – The Voluntary Commitment of the PVC industry is a 10 year programme, including mid-term revision of targets in 2005 and definition of new objectives in 2010 that will take into account technical progress and the enlargement of the EU. It also includes a strict implementation monitoring process through certified annual reports.**

A formal legal entity called **Vinyl 2010** will be set up and responsible for the management of the Voluntary Commitment, gathering the whole PVC industry chain and open to a partnership with all interested parties. The PVC industry will provide a financial support scheme, in particular for new technologies and recycling schemes, allowing up to 250 million euro of financial contribution over the 10 year programme.

**Vinyl 2010** includes the following key actions and commitments:

- Compliance to ECVM Charters regarding PVC production emission standards;
- A plan for full replacement of lead stabilisers by 2015, in addition to the replacement of cadmium stabilisers which was achieved in March 2001;
- The recycling in 2010 of 200,000 tons of post-consumer PVC waste. This objective will come in addition to 1999 post-consumer recycling volumes and to any recycling of post-consumer waste as required by the implementation after 1999 of EU Directives on packaging waste, end-of-life vehicles and waste electronic and electrical equipment;
- The recycling of 50% of the collectable available PVC waste for windows profiles, pipes, fittings and roofing membranes in 2005, and flooring in 2008;
- A research and development programme on new recycling and recovery technologies, including feedstock recycling and solvent-based technology;
- The implementation of a social charter signed with the European Mine, Chemical and Energy Worker's Federation (EMCEF) to develop social dialogue, training, health, safety and environmental standards, including transfer to EU accession countries;
- A partnership with local authorities within the Association of Communes and Regions for Recycling (ACRR) for the promotion of best-practices and pilot recycling schemes at local level.

## ① Introduction

**The PVC industry (manufacturers, additive producers and converters as represented by their European Associations ECVM,<sup>1</sup> ECPI<sup>2</sup>, ESPA<sup>3</sup>, EuPC<sup>4</sup>) is uniting voluntarily to meet the challenge of sustainable development.**

It adopted an integrated approach to deliver responsible cradle to grave management, culminating in the signature in March 2000 of a 'Voluntary Commitment of the PVC Industry'.

This Voluntary Commitment received a wide range of comments during an extensive phase of public and political consultation<sup>5</sup> following the publication of the European Commission's Green Paper on PVC<sup>6</sup>.

Vinyl 2010 – the Voluntary Commitment of the PVC industry has been further developed to address these comments and additional points raised by the European Commission's responsible Directorates General Environment and Enterprise.

This Voluntary Commitment is presented to the European Commission against the background of Commission policies inviting stakeholders to participate in achieving environmental goals as outlined in the Sixth Environment Action Programme of the European Community 2002–2010.

With Vinyl 2010, the PVC industry undertakes to implement important principles and actions covering the period 2000 – 2010 and beyond, which will apply to

- PVC manufacture (section 2.1)
- Additives – plasticisers and stabilisers (section 2.2)
- Waste management (section 2.3)
- Social progress and dialogue (section 2.4)
- Management, monitoring and financial scheme (section 3)

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1 European Council of Vinyl Manufacturers

2 European Council for Plasticisers and Intermediates

3 European Stabilisers Producers Association

4 European Plastics Converters

5 in particular, public hearing organised by the European Commission on 23 October 2000 and European Parliament debates and resolution R5-0171/2001 of 03 April 2001

6 COM(2000)0469 26 July 2000

## ② Vinyl 2010 – The Voluntary Commitment

Vinyl 2010 – The Voluntary Commitment of the PVC industry embraces the principles of Responsible Care<sup>®7</sup> and follows the general concepts and guidelines when setting out specific undertakings in this document. In particular, it addresses the key issues regarding parties, subject, definition of terms, quantified objectives, staged approach, specification of obligations, monitoring of results, periodic reporting, access to information, collection, evaluation, verification of results, accession of third parties, duration and revision.

### OBJECTIVES

The Chemical Industry is committed to continuous improvement as defined by Responsible Care<sup>®</sup>, and the implementation of product stewardship ideals. With this Voluntary Commitment, the PVC industry takes a further step towards sustainable development by addressing all stages of the PVC lifecycle, from manufacture to end-of-life.

All sectors working with PVC are involved, from PVC manufacturers to additive producers and converters. The PVC industry looks forward to involving stakeholders in the process of monitoring implementation and review of this Commitment, and also in ensuring public awareness for this initiative and its achievements.

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<sup>7</sup> see definition of terms in Appendix 4

### 2.1 PVC Manufacture

The first stage in the lifecycle of PVC is its manufacture and here we highlight the importance of product stewardship and eco-efficiency.

#### **Compliance with ECVM Industry Charter for production of Vinyl Chloride Monomer (VCM) and Suspension PVC**

PVC manufacturers commit to ensuring that each of their VCM and Suspension PVC plant in Europe fully complies with the 1995 ECVM Charter<sup>8</sup>. The environmental criteria are compatible with the “Best Available Technique” (BAT) recently adopted by the OSPAR Commission. For the Charter, an independent compliance audit was carried out in April 1999 and results were published in July 1999. A 96% compliance rate was achieved in June 2000 and full compliance will be externally audited and published by the end of 2002.

The potential for further plant optimisations is being investigated in 2001.

#### **Implementation of the ECVM Industry Charter for the manufacture of Emulsion PVC**

PVC manufacturers commit to comply with the Emulsion PVC Charter<sup>9</sup> signed in February 1999. The Charter’s deadline for compliance is the end of 2003 and compliance will be externally audited and published by mid 2004.

#### **Drive to improve the eco-efficiency of PVC resin, plasticiser and stabiliser manufacture**

Eco-efficiency is a concept at the heart of the World Business Council for Sustainable Development (WBCSD) philosophy. Eco-efficiency is a combination of economic and ecological efficiency and this concept is supported by the PVC industry. On this basis, PVC resin, plasticiser and stabiliser manufacturers commit as individual companies to:

- Continue to improve their resource consumption (material and energy use) during manufacture.
- Set ongoing targets to reduce resource consumption where this is economically and ecologically warranted.
- Review their progress towards such targets on an annual basis.

### 2.2 Additives

Additives play a key role in creating the unique range of performance characteristics, which allow the innovative development of PVC applications. Essentially, additives include stabiliser systems to ensure durability and plasticisers to give a range of flexibility.

The use of these materials is subject to a range of existing regulations. The field of regulation is continuously evolving with risk assessments playing an important role. The PVC industry fully supports and is deeply involved in the process of assessing the risks of additives. The PVC industry commits itself to the following actions with respect to the future use of plasticisers and stabilisers:

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<sup>8</sup> see Appendix 1

<sup>9</sup> see Appendix 2

### 2.2.1 Plasticisers

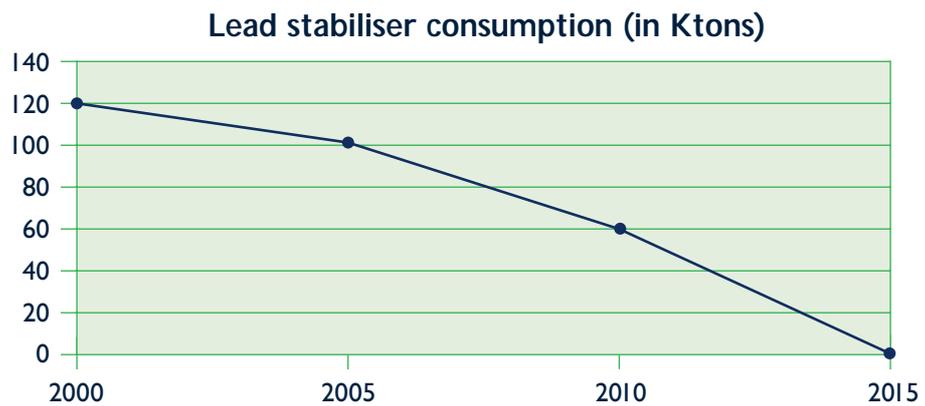
- The plasticisers industry will continue to conduct research in order to provide scientific studies and expertise to help policy-makers develop well-informed decisions at the earliest possible time. The European industry continues to spend approximately 1 million euro a year on such research.
- The sector will continue to improve the already sizeable scientific database of its products consistent with Responsible Care® principles and use it to propose improvements based on the results of EU risk assessments. Risk assessments of the major phthalates are expected to be completed in 2002. If warranted by the results, appropriate risk reduction measures will be taken by industry.
- Industry supports the concept of Lifecycle Inventory (LCI) evaluation of materials in order to highlight possible improvements. An eco-profile report was published in 2001 and will be regularly updated to provide the basis for additional lifecycle work covering plasticised PVC products.

### 2.2.2 Stabilisers

- The use of cadmium in all stabiliser systems placed on the European market was phased out in March 2001, as part of the initial steps of this Voluntary Commitment. This took into account technical feasibility in line with Council Resolution of 25 January 1988 (88/C30/01). This means that no members of ESPA will sell such products in the European Union, Norway and Switzerland, and that EuPC communicates to its members not to use cadmium based stabilisers.
- ESPA members commit to carrying out initial risk assessments on lead stabilisers under the CEFIC and ICCA programmes “Confidence in Chemicals” by 2004. National Regulators in a number of EU countries approve the use of lead stabilisers for drinking water pipes, based on a risk assessment. A European approval scheme is also currently under development for drinking water pipes.
- ESPA members continue to research and develop alternative stabilisers to the widely used and highly effective lead-based systems. ESPA members spend approximately 5 million euro annually on this activity.
- ESPA will produce yearly statistics showing which stabilisers are purchased by the converters. It will also produce statistics showing which stabilisers are being used in window and profile production, pipe and cable applications.
- ESPA and EuPC commit to replace lead stabilisers to achieve the following reduction targets, measured on the basis of 2000 consumption levels:
  - 15% reduction by 2005
  - 50% reduction by 2010
  - 100% reduction by 2015

## Vinyl 2010 – Voluntary Commitment of the PVC industry

- Currently there is no unacceptable risk identified in the use of cadmium and lead stabilisers which would preclude the continued recycling of PVC applications containing such stabilisers. ESPA members will continue to work with the Commission on targeted risk assessment for such products.
- Accepting recycling of applications containing cadmium and lead is the best means to avoid dissemination of these substances into the environment.



## 2.3 Waste Management

The PVC industry supports an integrated waste management approach, which aims to maximise the efficient use of raw materials and utilise the best end-of-life treatment option per waste stream.

### 2.3.1 Voluntary commitment to develop recycling schemes

- The PVC industry will examine how recycling schemes already operating in some European countries (e.g. German scheme for PVC window frames as well as several schemes for pipes) could be expanded for use in other EU countries.
- The PVC industry has agreed in September 2001, with the Association of Communes and Regions for Recycling, the Association of Plastics Manufacturers in Europe and the European Plastics Recyclers, to develop a scheme promoting targeted waste collection and recycling projects in 2002.
- The PVC industry will support the dissemination of experience and best practices across Europe, in particular with regard to waste collection and recycling at local and regional level.

#### a) Mechanical recycling

In-house recycling of PVC fabrication waste is already at a high level of conversion efficiency.

- Take-back schemes have been set up in recent years to recycle PVC waste from processing and installation works. By the end of 2002 the industry will have identified the generation and sources of this waste category to set meaningful improvement targets.
- For the mechanical recycling of end-of-life PVC products, the PVC industry will examine the various applications for recycling potential against the following criteria:
  - Products should be easy to sort and identify for separation into clean fractions, suitable for further treatment.
  - Sufficient quantities should be collected to fill industrial plant capacities, with waste transported within reasonable distances.
  - Quality of recyclate should match marketable applications at competitive economic conditions.

**The Plastics pipe and fitting producers**, represented by TEPPFA<sup>10</sup> commit to mechanically recycle increasing quantities of PVC pipes and fittings at their end-of-life. The commitment is to recycle at least 50% of the collectable available quantity of pipe and fittings waste by 2005.

- *Target in 2003: 25%*
- *Target in 2005: 50%*

**Implementation:** On the basis of prior experience and through start-up of new recycling schemes and improving existing recycling schemes.

**Reporting and monitoring:** An annual report will be provided to the European Commission.

**Revision of targets:** On the basis of third party assessments after the initial period.

10 TEPPFA : The European Plastics Pipes and Fittings Association – EUPC sector group

**The window frame sector**, represented by EPPA<sup>11</sup> commits to mechanically recycle increasing quantities of PVC window frames at their end of life. The commitment is to recycle at least 50% of the collectable available quantity of window profile waste by 2005.

- *Target in 2003: 25%*
- *Target in 2005: 50%*

**Implementation:** On the basis of prior experience and through start-up of new recycling schemes and improving existing recycling schemes.

**Reporting and monitoring:** An annual report will be provided to the European Commission.

**Revision of targets:** On the basis of third party assessments after the initial period.

- The PVC industry commits to develop the use of high-quality mechanically recycled PVC in new products. It is important to bear in mind that the PVC industry has already developed a systematic take-back scheme for production waste and will develop similar schemes for installation and transformation waste.

### b) Feedstock recycling

This is a new technique developed for the recycling of 'PVC rich' plastic waste, such as PVC coated fabrics, automotive interior trim, cable harnesses, floorings and other composite structures. It is assumed that, by 2005, feedstock recycling will make a substantial contribution to the treatment of PVC rich plastic waste, if its technical and economical feasibility is demonstrated.

- PVC producers will have invested, by the end of 2002, 3.3 million euro into a pilot plant using the Linde gasification technology to recover the chlorine and hydrocarbons. Depending on the outcome a decision on the building of a commercial scale plant will be made.
- The PVC industry will continue investigating in parallel other potential feedstock recycling processes and will complete assessments of environmental and economic benefits of these processes.

### c) Additional recycling programmes and new technologies

**The flooring sector**, represented by EPFLOOR<sup>13</sup> commits to recycle increasing quantities of PVC flooring at the end of life of this application. The commitment is to recycle at least 50% of the collectable available quantity of PVC flooring waste by 2008.

- *Target in 2006: 25%*
- *Target in 2008: 50%*

**Implementation:** On the basis of prior experience and through start-up of new recycling schemes and improving existing recycling schemes.

**Reporting and monitoring:** An annual report will be provided to the European Commission.

**Revision of targets:** On the basis of third party assessments after the initial period.

<sup>11</sup> EPPA : European PVC window Profile and related building Products Association – EUPC sector group

<sup>12</sup> Recycling percentages for 2000 are not directly comparable with targets for later years because available collectable quantities could not be calculated for 2000.

<sup>13</sup> EuPC PVC Flooring Sector Group

**The roofing membranes sector**, represented by ESWA<sup>14</sup> commits to recycle increasing quantities of PVC roofing membranes at the end of life of this application. The commitment is to recycle at least 50% of the collectable available quantity of roofing membranes waste by 2005.

- Target in 2003: 25%
- Target in 2005: 50%

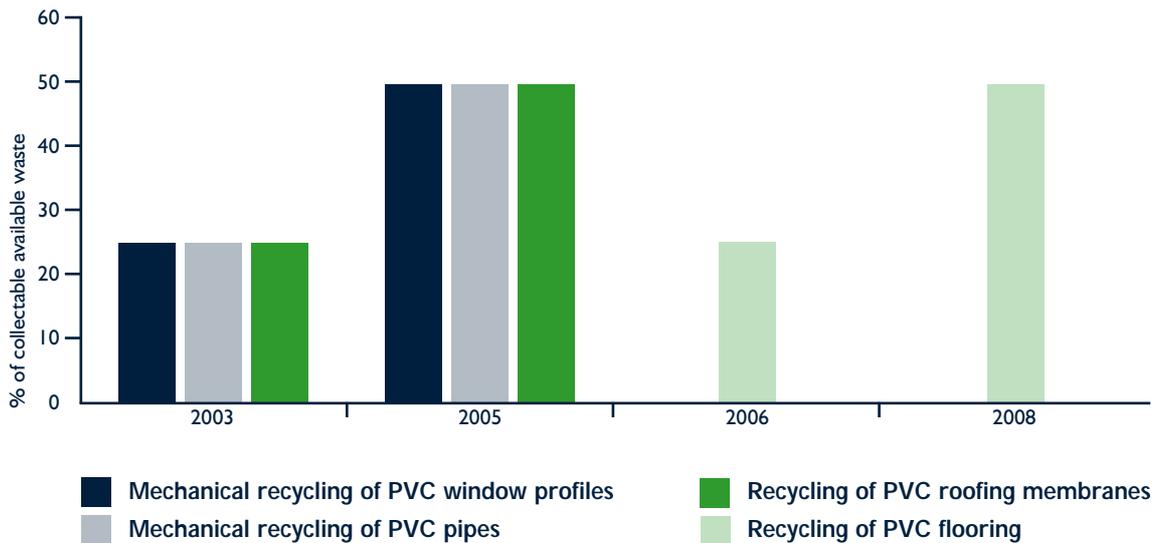
**Implementation:** On the basis of prior experience and through start-up of new recycling schemes and improving existing recycling schemes.

**Reporting and monitoring:** An annual report will be provided to the European Commission.

**Revision of targets:** On the basis of third party assessments after the initial period.

For PVC cables and coated fabrics, a solvent-based technology has been demonstrated on pilot scale and will be commercially implemented in 2002/2003.

### Evolution mechanical and additional recycling targets<sup>12, 15</sup>



<sup>14</sup> European Single ply Waterproofing Association

<sup>15</sup> Recycling percentages for 2000 are not directly comparable with targets for later years because available collectable quantities could not be calculated for 2000.

## Vinyl 2010 – Voluntary Commitment of the PVC industry

Together with the development of additional mechanical recycling and feedstock recycling schemes, the industry intends to recycle a total of 200,000 tons post-consumer PVC waste in 2010.

This objective will come in addition to 1999 post-consumer recycling volumes<sup>16</sup> and to any recycling of post-consumer waste as required by the implementation after 1999 of EU Directives on packaging waste, end-of-life vehicles and waste electronic and electrical equipment<sup>17</sup>.

For this recycling volume to be reached there is a need for support from public authorities to create and organise appropriate waste collection schemes. The PVC industry will work with all the stakeholders in order to develop the recycling schemes.

### 2.3.2 Municipal solid waste incineration and other recovery processes

Municipal solid waste incineration (MSWI) with energy recovery will play an increasingly important role in sustainable waste management concepts. PVC present in the waste stream contributes to energy recovery.

Salt residues are by-products of some MSWI technologies. Only part of these residues are due to PVC waste.

#### The PVC industry commits to:

- Support technology developments in order to minimise the quantities of salt residues produced;
- Develop purification technologies, with the objective to recover the salt to be reused in chemical processes, and minimise the final residues to be disposed.

Based on the concept of sustainable development and eco-efficiency of recovery, the industry will put its expertise to work to promote and support the development of energy recovery.

## 2.4 Social progress and dialogue

European PVC industry employers (ECVM, ECPI and ESPA) and unions (EMCEF<sup>18</sup>) signed in October 2000 a social dialogue charter<sup>19</sup> on issues surrounding the sector's future and its potential social effects on employees.

#### Through this charter, the PVC industry commits in particular to:

- The development of European health, safety and environmental standards
- Employee training
- Standards transfer to EU accession countries
- Dialogue on European works councils

<sup>16</sup> Estimated at 100 000 Tonnes – European Commission Green Paper on PVC (page 16)

<sup>17</sup> Respectively: European Parliament and Council Directive 94/62/EC of 20 December 1994, European Parliament and Council Directive 2000/53/EC of 18 September 2000, Proposal for a European Parliament and Council Directive COM(2000)0347 – awaiting adoption

<sup>18</sup> European Mine, Chemical and Energy Workers' Federation

<sup>19</sup> See Appendix 3

## ③ Management, Monitoring and Financial Scheme

### 3.1 Rationale for a financial commitment

Sufficient investment is important to underpin the PVC industry's commitments. For this reason, the PVC industry will provide a meaningful level of resources to support the Voluntary Commitment.

### 3.2 Management

- The PVC industry will set up a formal legal entity, Vinyl 2010, to manage the Voluntary Commitment. A Management Committee, made of two representatives of each of the four associations, is currently leading the process.
- The essential elements of this Commitment are verifiable objectives and quantifiable targets. These will be set out with interim deadlines to provide a staged approach to reaching the ultimate objectives.
- A rolling three-year framework programme will be proposed by the management entity of Vinyl 2010 and approved by the individual associations. This programme will describe the projects selected in order to meet the industry commitments as set out in section 2 of this Voluntary Commitment.

### 3.3 Monitoring and reporting

- Annual results will be made publicly available. In line with the industry commitment to openness, annual reports will be thorough and fully transparent.
- A Monitoring Committee composed of representatives of the European Commission, Trade Unions, non-governmental organisation and representatives of the four associations, will be established to annually review achievements of the Voluntary Commitment.
- Comments and recommendations of the Monitoring Committee will be published in the annual progress report addressed to the European Union institutions.
- The fulfilment of objectives will be reviewed in 2005 and again in 2010 so that targets can be revised taking into account technical progress, enlargement of the European Union and recommendations from the Monitoring Committee.

An independent third party will be chosen by the Monitoring Committee to verify and evaluate achievements.

### 3.4 Financing of Projects

ECVM, ECPI, ESPA and EuPC member companies will provide, directly and indirectly, the amounts necessary to achieve the specific projects agreed upon.

The total amount contributed through the associations will be defined by the agreed projects, with the understanding that the total financial contributions may reach up to 25 million euro per year.

Vinyl 2010 – Voluntary Commitment of the PVC industry

On behalf of the four organisations,



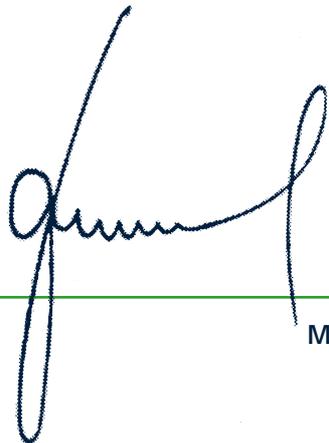
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Jean-Pierre Pleska, *Chairman of ECVM*



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Herman Jansseune, *Chairman of ECPI*



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Michael Rosenthal, *Chairman of ESPA*



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Victor Dierinckx, *Chairman of EuPC*

2 October 2001, Brussels

## Appendix 1: ECVM Industry Charter for Production of VCM and Suspension PVC

### Introduction

Polyvinyl Chloride (PVC) is one of the world's oldest plastics and has evolved since the 1940s to become a universally-used, cost effective, adaptable, safe and environmentally-effective material. It is a highly efficient converter of raw materials, combining salt and oil to produce a plastic that is specified for a broad range of long and short life applications.

Production processes for vinyl chloride monomer (VCM) and PVC have been continually improved in recent years and their environmental impact steadily reduced. The European PVC industry recognises, however, that further improvements must be pursued and their scope continually reviewed and widened.

### Objectives

ECVM member objectives are:

- To prevent any detrimental effects from their operations and products to the environment or human health, as far as is in their command.
- To comply, as a minimum requirement, with environmental regulations and quality standards laid down by national and international regulatory authorities.
- To achieve a 'closed loop concept' production process, as far as is feasible with practicable technology.

### Directives

- Operations covered by this Charter include all processing, handling, storage and transport of primary feedstocks and final products (excluding the conversion of PVC resin to the finished article).
- All recoverable quantities of VCM and ethylene dichloride (EDC) in waste streams from the production process are recovered and recycled into the process, as far as it is possible with reasonable efforts. Residual levels of VCM and EDC in waste streams are treated by appropriate technology before these waste streams are discharged into the environment.
- Control technology is implemented in VCM/EDC production to eliminate discharge of heavy metals and dioxin-like components to the extent that:
  - Effluent discharge does not result in exceeding established water quality standards.
  - Contaminant levels in vent-gases do not exceed the European standard for waste incineration.
- All significant outlets for vent-gases and effluents from the production process are kept under surveillance and valued, in order to determine the effectiveness of the control technology and to measure the final discharge of potential contaminants into the environment.
- Fugitive emissions are reduced by installing leak-safe technology and by frequent inspections to check the integrity of all relevant sealings. This can be supported by installing fixed monitoring systems for measuring VCM/EDC concentrations.
- Liquid chlorinated organic by-products from the production process, if not recycled as feedstock for other chlorination processes, are destroyed with recovery of chlorine in the form of HCl.
- Residual levels of VCM in the final PVC product will not exceed the amounts agreed.

## The Members of the European Council of Vinyl Manufacturers (ECVM)

### Accept

- That all production, manufacturing and disposal processes of modern industrialised society have an impact on the environment. PVC is no exception.
- That the European PVC industry's stakeholders have the right to expect that impact is determined and, if necessary, reduced in order to meet environmental quality objectives within the scope of Best Available Techniques (BAT) experience and resources.
- That, as a material whose production, use and disposal continually evolves, stakeholders have the right to expect the industry to be vigilant and forward-looking in ensuring that appropriate objectives are set and met.
- That all ECVM Members will share their environmental control 'know how' by bilateral agreement.

### Commit

To agree priorities for environmental control and improvement to:

- Reduce emissions and other environmental pollutants by introduction of voluntary, controlled systems of target-setting, measurement, and operational improvements, setting short, medium and long-term targets that consistently maintain improvements in environmental performance.
- Invest in research to pursue future improvements in line with the agreed priorities.
- Work in associated industry groups, where appropriate, to improve understanding of shared environmental concern, and to improve processes and technologies to minimise environmental impacts, such as improved recycling and incineration techniques.
- Annually review priority standard targets and future areas for action.
- ECVM will, at a later stage, include parameters relevant for Emulsion-PVC production.
- To ensure that the environmental control performance, if not made by the national authorities, will be open to review by an independent third party (e.g.: an accredited environmental verifier according to the rules of the European Union Eco Audit Scheme) subject to specification and agreement between ECVM and Member companies.
- To agree that, whereas some companies already comply with the criteria of this Charter, those that do not yet comply will use their best efforts to do so by 1998.

### Act

- To ensure that any ECVM Member which consistently fails to meet agreed industry targets of environmental improvement over clearly defined periods of time, is called to account.
- To work with other industry bodies, Non-Governmental Organisations (NGOs), stakeholder groups and other interested organisations to agree common working agendas to improve environmental performance as research, science and technology increase understanding of the relationship between the PVC industry's activities and the needs and concerns of its stakeholder communities.

#### Annex to Industry Charter for Production of VCM and PVC (Suspension Process)

Reference: ECVM Best Available Techniques

#### Environmental Standards for EDC and VCM Production

##### Emission Limits for all Vent-Gases:

VCM:	< 5 mg/Nm <sup>3</sup>
EDC:	< 5 mg/Nm <sup>3</sup>
HCl:	< 30mg/Nm <sup>3</sup>
Ethylene:	< 150mg/Nm <sup>3</sup>
Dioxin-like components:	< 0.1 ng/TEQ/Nm <sup>3</sup>

##### Discharge Limits for Total of Aqueous Effluents:

EDC:	< 5g/ton of EDC purification capacity
Copper:	< 1g/ton of oxychlorination capacity
Dioxin-like components:	< 1µg TEQ/ton of oxychlorination capacity

##### Environmental Standards for PVC Production (Suspension Process)

Total VCM-emission from PVC-production:	< 100g/ton of PVC
VCM-concentration in aqueous effluents:	< 1g/m <sup>3</sup> of effluent
VCM-concentration in final regular product:	< 5g/ton of PVC (for general purposes) < 1g/ton of PVC (for food/medical applications)

## Appendix 2: ECVI Industry Charter for the Production of Emulsion PVC

### Introduction

Polyvinyl chloride (PVC) is one of the world's oldest plastics and has evolved since the 1940s to become a universally-used, cost-effective, adaptable, safe and environmentally-effective material.

It is a highly efficient converter of raw materials, combining salt and oil to produce a plastic that is specified for a broad range of long and short life applications.

Production processes for PVC have been continually improved in recent years and their environmental impact steadily reduced. The European PVC industry recognises, however, that further improvements must be pursued and their scope continually reviewed and widened.

### Objectives

The objectives of Members of the European PVC industry are:

- To prevent any detrimental effects from their operations and products to the environment or human health, as far as is in their command.
- To comply, as a minimum requirement, with environmental regulations and quality standards laid down by national and international regulatory authorities.
- To achieve a “closed loop concept” production process, as far as is feasible with practicable technology.

### Directives

- Operations covered by this Charter include all processing, handling, storage and transport of primary feedstocks and final products (excluding the conversion of PVC resin to the finished article).
- All recoverable quantities of VCM in waste streams from the production process are recovered and recycled into the process, as far as it is possible with reasonable efforts.
- Residual levels of VCM in waste streams are treated by appropriate technology before these waste streams are discharged into the environment.
- All significant outlets for vent-gas and effluents from the production process are kept under surveillance and valued, in order to determine the effectiveness of the control technology and to measure the final discharge of potential contaminants into the environment.
- Fugitive emissions are reduced by installing leak-safe technology and by frequent inspections to check the integrity of all relevant sealings. This can be supported by installing fixed monitoring systems for measuring VCM concentrations.
- Residual levels of VCM in the final PVC product will not exceed the amounts agreed.

## The Members of the European Council of Vinyl Manufacturers (ECVM)

### Accept

- That all production, manufacturing and disposal processes of modern industrialised society have an impact on the environment. PVC is no exception.
- That the European PVC industry's stakeholders have the right to expect that that impact is determined and, if necessary, reduced in order to meet environmental quality objectives within the scope of Best Available Techniques (BAT) experience and resources.
- That, as a material whose production, use and disposal continually evolves, stakeholders have the right to expect the industry to be vigilant and forward-looking in ensuring that appropriate objectives are set and met.
- That all ECVM Members will share their environmental control 'know how' by bilateral agreement.

### Commit

- To agree priorities for environmental control and improvement to:
  - Reduce emissions and other environmental pollutants by introduction of voluntary, controlled systems of target-setting, measurement, and operational improvements, setting short, medium and long-term targets that consistently maintain improvements in environmental performance.
  - Invest in research to pursue future improvements in line with the agreed priorities.
  - Work in associated industry groups, where appropriate, to improve understanding of shared environmental concern, and to improve processes and technologies to minimise environmental impacts, such as improved recycling and incineration techniques.
  - Annually review priority standard targets and future areas for action.
- To ensure that the environmental control performance, if not made by the national authorities, will be open to review by an independent third party (e.g.: an accredited environmental verifier according to the rules of the European Union Eco Audit Scheme) subject to specification and agreement between ECVM and member companies.
- To agree that, whereas some companies already comply with the criteria of this Charter, those that do not yet comply will use their best efforts to do so by end 2003.

### Act

- To ensure that any ECVM Member which consistently fails to meet agreed industry targets of environmental improvement over clearly-defined periods of time, is called to account.
- To work with other industry bodies, Non-Governmental Organisations (NGOs), stakeholder groups and other interested organisations to agree common working agendas to improve environmental performance as research, science and technology increases understanding of the relationship between the PVC industry's activities and the needs and concerns of its stakeholder communities.

Annex to Industry Charter for Production of E – PVC (Emulsion Process)			
Reference: ECVM Best Available Techniques			
Environmental Standards for PVC Production (Emulsion Process)			
Total VCM-emission in the air:	<	1000	g/ton of E-PVC
VCM-emission in aqueous effluents			
For stand alone Emulsion PVC plant :	<	1	g/m <sup>3</sup> of effluent
	and	<	10
			g/t of E-PVC
In case of common treatment with Suspension PVC units :	<	1	g/m <sup>3</sup> of effluent
	or	<	5
			g/t of E+ S-PVC
VCM-concentration in final regular product:	<	1	g/ton of E-PVC

## Appendix 3: Social Dialogue Charter of the PVC Industry

### 17th October 2000

The industry associations ECVM, ECPI and ESPA on one hand and EMCEF on the other hand have agreed to set up a social dialogue on important issues for all involved partners. The following agreement describes these issues.

It has also been agreed that this dialogue will be a permanent and sustainable process between industry and unions. Therefore regularly meetings and consultations will take place.

The further development of the dialogue will be discussed at least once a year. Participants at the annual meetings will be representatives of the leading bodies of the partners, working together as part of a common steering committee. ECVM, ECPI and ESPA will be represented by a maximum of 2 representatives per organisation – EMCEF by a maximum of 6.

It is one of the targets of the agreement that decisions, of any kind, are taken in a good and common understanding.

It is the intention of the partners to contribute to the process of European unification and enlargement, as part of their common activities. They are therefore looking for further possibilities to get involved in European programmes and activities, in order to help to achieve the common goals.

### Creation of a Forum for Social Dialogue in the PVC Industry

The ongoing debate on PVC issues has highlighted the need for a permanent social dialogue between employers and employees, as part of efforts and progress to achieve sustainability.

After several meetings, ECVM, ECPI and ESPA on one hand and EMCEF on the other hand have agreed on the establishment of a forum for dialogue on vital issues for the future of the PVC industry and their potential social effects on employees.

The following issues will be the subject of this dialogue:

#### 1. Development of the PVC industry against the backdrop of European policy

The perspectives of an industry sector are crucial for decisions on investment, research activities and jobs. Environmentally compatible and safe production, application and recycling methods are the best guarantee for long-term job security and the economic viability of a company. The company and its workforce share an interest in such sustainable development and the safeguarding of PVC production, even so their positions may differ on minor issues.

ECVM, ECPI, ESPA and EMCEF consequently agree to make the further development of the European PVC industry a subject for regular deliberations.

#### 2. Health and safety and environmental standards

In the EU, the production, use and recycling of PVC applications and their raw materials are governed by the respect of high safety and environmental standards. These high standards guarantee a safe production and use of PVC applications without detrimental effects on the health of the employees and customers, and the environment. Such high standards require continual research and implementation of new scientific findings and a clear focus on health and safety as well as environmental issues. At company level appropriate and comprehensive information and training of the workforce are an important condition for handling PVC and its raw materials safely.

ECVM, ECPI, ESPA and EMCEF agree to continually help raise these standards through regular discussions on PVC research activities and findings. Sharing plans and developing employee information will make a valuable contribution to achieving the highest possible standards.

All of the organisations will include the results of the joint initiative in their discussions on environmental protection and health and safety at European level.

Furthermore, they are interested in dialogue with other institutions and stakeholders that are equally concerned with PVC issues.

### 3. Training and further training

High technological standards as well as a qualified, competent and motivated workforce are the prerequisites for high environmental, health and safety standards in the PVC industry.

A high level of training is essential for employment security within the PVC industry and also for the creation of employment opportunities in allied industries. ECVM, ECPI, ESPA and EMCEF will jointly work on the development of standards for training and further training geared to the needs of the PVC industry.

### 4. Transfer of standards to the accession countries

As in other sectors, the standards and regulations on health and safety and environmental protection in accession countries often do not match the high levels attained in the EU countries. ECVM, ECPI, ESPA and EMCEF consequently have a vested interest in raising the standards in the accession countries as soon as possible to those applied in the EU member states.

ECVM, ECPI, ESPA and EMCEF agree to cooperate with any partner in the accession countries in order to raise the regulatory standards to EU levels and implement these standards without delay. There will be a regular information exchange on the situation in these and other countries.

### 5. Information for European Works Councils

Information and consultation of employee representatives in European Works Councils especially concerning economic and social issues have in the last few years become an integral part of corporate culture in many European undertakings.

In the light of the specific significance of health, safety and environmental issues, ECVM, ECPI, ESPA and EMCEF agree to encourage their members to include these topics in the discussions within their European Works Councils, especially where not done yet.

For companies with fewer than 1,000 employees, which are not covered by the European Works Council directive, ECVM, ECPI, ESPA and EMCEF envisage the establishment of a suitable information system for discussing these issues on a European level.

## Appendix 4: Definition of terms

### Additives

Materials which are blended with polymers to make them easy to process, give the physical properties required in the end-application and protect them from the effects of time and weather. Additives include mainly stabilisers and plasticisers.

### Best Available Techniques (BAT)

Under the EU Integrated Pollution Prevention and Control Directive BAT is defined as “the latest stage in development of activities, processes and their methods of operation which indicate the practical suitability of particular techniques as the basis of emission limit values for preventing, or where not practicable, minimising emissions to the environment as a whole, without predetermining any specific technology or other techniques.”

### Eco-efficiency

A concept developed by the World Business Council for Sustainable Development (WBCSD) encouraging businesses to become more competitive, more innovative and more environmentally responsible. Eco-efficiency is based on the similar idea that business must be ‘ecologically and economically efficient’ by ‘doing more with less’. Eco-efficiency performance indicators include: (1) reduction of material intensity, (2) reduction in energy intensity, (3) reduction of toxic dispersion, (4) enhancement of material recyclability, (5) use of renewable resources, (6) extension of product durability, (7) increase of service intensity.

### Emulsion PVC

Emulsion PVC (E-PVC) is produced using water, vinyl chloride monomer and an initiator soluble in water. Emulsion PVC applications are mostly sheets, profiles, flooring, wall covering, coated fabrics and sealants. Microsuspension is a variation of the emulsion process.

### Feedstock recycling

Feedstock recycling is a form of material recycling, particularly well suited to mixed plastics waste. These technologies, many under development today, break the plastics down into their chemical constituents. These can be used as building blocks for a wide range of new industrial intermediate and consumer products. In effect, the plastics are reprocessed at the place of origin, the petrochemical complex.

### Plasticiser

These are organic compounds, sometimes mixed with polymers to make a more flexible plastic. The most common plasticisers are phthalates, adipates and citrates.

### Polymer

An organic material composed of long chain molecules made up of many monomer units. Most plastics are polymers having a chain backbone of carbon atoms. Polymers are almost always blended with additives before use. Plastics = polymers + additives.

## Vinyl 2010 – Voluntary Commitment of the PVC industry

### Responsible Care®

Responsible Care® is the world-wide chemical industry's commitment to continual improvement in all aspects of health, safety and environment performance and to openness in communication about its activities and achievements. National chemical industry associations are responsible for the detailed implementation of Responsible Care® in their countries.

### Stabiliser

A stabiliser is a complex mixture designed to have a preventative and curative action in PVC, during processing and to protect the product during its life, including photodegradation.

### Suspension PVC

Suspension PVC (S-PVC) is produced using water, vinyl chloride and an initiator that is soluble in the monomer. The main applications for this type of PVC are pipes, cables, rigid profiles, and building applications.

### Thermoplastic

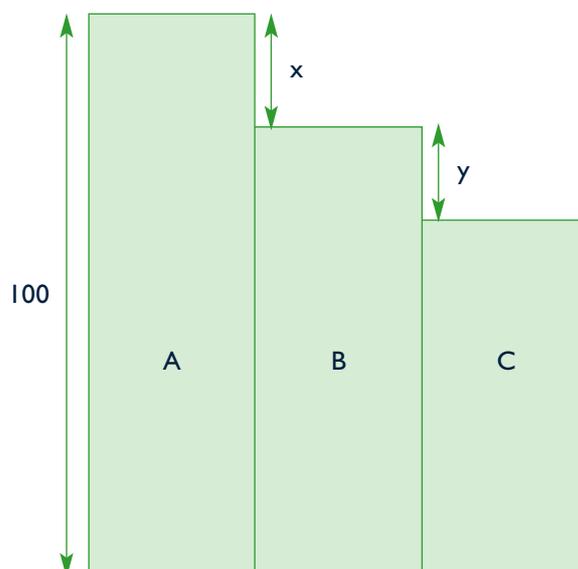
A polymer that softens when exposed to heat (the temperature depends on the type of plastic) and returns to its original condition when cooled to room temperature.

### Vinyl Chloride Monomer

Vinyl Chloride Monomer (VCM) is the monomer building block for the production of the PVC polymer.

### Waste – Available and Collectable Waste

The definition of the concepts of collectable and available waste is illustrated by the following graph:



“A” represents the total quantity of product (e.g. plastic pipes) arriving at the end of its useful life, i.e. not being used anymore, and assuming it amounts to 100.

“B” represents the available quantity, taking into account that a fraction “x” of A is not available at the end of its life (e.g. pipes staying in the ground). The available quantity is  $100 - x$ .

“C” represents the collectable available quantity of waste, taking into account that a part “y” of B cannot be collected for economic or technical reasons (e.g. re-use as second-hand product, impossibility to transport due to remoteness from existing collection network, size, etc.); this part y is expected to change over time. The collectable available quantity is equal to  $100 - x - y$ .

## Appendix 5: Contact details

If you would like more information on the PVC Industry Voluntary Commitment or any of the issues raised within this document, please consult the web site of Vinyl 2010, [www.pvcinitiative.com](http://www.pvcinitiative.com), or contact any of the organisations listed below:



### The European Council of Vinyl Manufacturers (ECVM)

Represents the European PVC producing companies and is a division of the Association of Plastic Manufacturers in Europe (APME). Its membership includes the 10 leading European PVC producers which together account for over 95 per cent of Europe's production of PVC resin.

Avenue E van Nieuwenhuysse 4  
B-1160 Brussels  
Tel: + 32 2 676 74 43  
Fax: + 32 2 676 74 47  
[www.ecvm.org](http://www.ecvm.org)



### The European Stabilisers Producers Associations (ESPA)

ESPA represents the whole of the European stabilisers industry through its four branches:

- European Lead Stabilisers Association (ELSA)
- European Tin Stabilisers Association (ETINSA)
- European Calcium Organic Stabilisers Association (ECOSA)
- European Liquid Stabilisers Association (ELISA)

Avenue E van Nieuwenhuysse 4  
B-1160 Brussels  
Tel: + 32 2 676 72 86  
Fax: + 31 2 676 73 01



### The European Council for Plasticisers and Intermediates (ECPI)

ECPI represents the interests of 26 member companies that are involved in the production of plasticisers. Plasticisers are esters (mainly phthalates) which are used generally in the production of flexible plastic products, predominantly PVC.

Avenue E van Nieuwenhuysse 4  
B-1160 Brussels  
Tel: + 32 2 676 72 60  
Fax: + 32 2 676 73 01  
[www.ecpi.org](http://www.ecpi.org)



### European Plastics Converters (EuPC)

EuPC represents approximately 30,000, predominantly medium-sized, plastic processing operations in Europe. These companies have over one million people on their payrolls, 85% of whom work for companies that employ less than 100 people. The individual members combine to produce a processing capacity of more than 30 million tonnes of plastic every year.

Avenue de Cortenberghe 66  
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Tel: + 32 2 732 41 24  
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