

# Vinyl 2010

The Voluntary Commitment  
of the PVC Industry





## VINYL 2010 - KEY MILESTONES OF THE VOLUNTARY COMMITMENT OF THE PVC INDUSTRY

	2001	2002	2003	2004
<b>Management</b>	Publication of 1 <sup>st</sup> annual report in April	Set up of legal entity		
<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 initial risk-assessment on lead stabilisers
<b>Waste management</b>				
<i>Mechanical recycling targets</i>			Achievement of 25% recycling of pipes and windows*	
<i>Additional recycling targets</i>			Achievement of 25% recycling of waterproofing membranes*	
<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)		

\* Refers to collectable available quantities of post-consumer PVC waste

2005	2006	2007	2008	2009	2010
Revision of objectives					
Completion of Phthalates risk-assessment (EU process) Achievement of 15% reduction target for use of lead stabilisers in EU 15	End of sales of cadmium stabilisers in all EU-25 Member States				50% reduction target of use of lead stabilisers (100% phase out of lead stabilisers in all EU-25 Member states by 2015)*
					Total recycling of 200 000 additional tonnes post-consumer PVC waste
<i>Achievement of 50% recycling of pipes and window*</i>					
<i>50% recycling of waterproofing membranes (Achieved 31.5%)*</i>					

## THE MID TERM REVIEW

Planned from the outset in 2000, the purpose of the mid-term review in 2005 was to update the initial engagements of the Voluntary Commitment in line with experience and changes in circumstances on the ground.

### PVC resin manufacturing

The members of ECVM<sup>1</sup> adhere to Charters on the production of Vinyl Chloride Monomer (VCM) and Suspension PVC (S-PVC) and on Emulsion PVC (E-PVC).

Det Norske Veritas (DNV) - a well-known independent verification consultancy - carried out a first audit of compliance in April 1999. Results were published in July. In 2002 DNV undertook a second review of compliance at each of the 38 production sites of ECVM's members, based on the 12 different standards relevant to the VCM/S-PVC manufacturing chain. Compliance results were:

- 93% full compliance, up from 88% in 1998.
- 4% either partial compliance or compliance not entirely confirmed due to remaining uncertainties about reported data.
- 3% non compliance.

Regarding the Emulsion PVC Charter, the deadline for compliance was at the end of 2003. Data were collated in 2004 and DNV conducted its audit in early 2005.

Overall compliance was 71% against the combined three criteria for VCM emissions to air (86% compliance), water (71%) and in final product (57% of sites, but 95% of production volume).

Emission levels from ECVM member plants are now extremely low and pose no concern to the environment, in line with long term Sustainable Development goals. Environmental emissions are now covered at European level by BREFs (Best Available Technique reference document) under the management of the European Commission. The BAT Associated Emission Levels mentioned in this document set new and challenging goals for a further reduction of environmental impact, beyond the impressive achievements of these ECVM Charters.

<sup>1</sup> European Council of Vinyl Manufacturers

<sup>2</sup> European Stabilisers Producers Association

### Stabilisers

Industry stopped selling stabiliser systems based on cadmium in all of the EU 15 countries in 2001.

Regarding lead stabilisers, ESPA<sup>2</sup> members achieved the mid-term goal of a 15% reduction one year ahead of plan in 2004.

The Voluntary Risk Assessment on lead and lead compounds carried out by independent experts was finalised in 2005 and submitted to the European Commission, which distributed it to the member states for comments.

### Plasticisers

EU risk assessments for three of the five most commonly used phthalates – diisononyl phthalate (DINP), diisodecyl phthalate (DIDP) and dibutyl phthalate (DBP) – were published in 2005. The assessments showed no concern for any current uses of DINP and DIDP. The third risk assessment, for dibutyl phthalate (DBP), shows some risk to plants in the vicinity of processing sites and to workers through inhalation. But in both cases, these risks can be further reduced by simple air treatment measures and use of personal protective equipment.

These risk assessment reports are available on the European Chemicals Bureau website (<http://ecb.jrc.it>) as well as on the Phthalates Information Centre website ([www.phthalates.com](http://www.phthalates.com)).

The risk assessments for di-2-ethylhexyl phthalate (DEHP) and butylbenzyl phthalate (BBP) are still in progress and are expected to be finalised and published in 2006. DEHP is currently under consideration for potential risk reduction measures

Plasticisers, like all chemical substances, will be subject to the new EU chemicals legislation – REACH (Registration, Evaluation and Authorisation of Chemicals).



## Experience and insights on 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.

Subsequent to the publication of the Voluntary Commitment in 2000, data from studies commissioned by Vinyl 2010 and practical experience show that the volumes of available collectable PVC post consumer waste are lower than previously estimated. The principal reasons are the longer in-service life of several applications than initially forecasted, the continuing ready availability of cheap landfill options for waste disposal in most EU Member States and the direct re-use of some 'end-of-life' applications (e.g. window profiles).

For the recycling targets to be reached there is a continuing 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.

## Partnership on waste and recycling with ACR+

The PVC industry has worked since September 2001 together with the Association of Cities and Regions for Recycling and Sustainable Resource Management (ACR+), *PlasticsEurope* and the European Plastics Recyclers to improve the recycling of plastic waste collected by local authorities. The partnership has proved most encouraging and is being continued.

## THE VOLUNTARY COMMITMENT

### Introduction

The PVC industry (PVC manufacturers, PVC additive producers and PVC converters as represented by their European associations ECVM, ECPI<sup>3</sup>, ESPA, EuPC<sup>4</sup>) have united voluntarily to meet the challenge of sustainable development.

The industry adopted an integrated approach to implement the concept of 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** is the legal entity putting into practice the promises of the Voluntary Commitment.

It operates against the background of Commission policies inviting stakeholders to take pro-active initiatives and participate in achieving environmental goals as outlined in the Sixth Environment Action Programme of the European Community 2002-2010. This programme was also under review in 2005.

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

- PVC manufacturing.
- Additives - plasticisers and stabilisers.
- Waste management.
- Social progress and dialogue.
- Management, monitoring and financial scheme.

<sup>3</sup> European Council for Plasticisers and Intermediates

<sup>4</sup> European Plastics Converters

## Objectives

The chemical industry at large is committed to continuous improvement as defined by the concept of Responsible Care®, and realised by the implementation of product stewardship ideals. With the implementation of this Voluntary Commitment, the PVC industry continues its drive towards sustainable development by addressing all stages of the PVC life cycle, from manufacture to end-of-life.

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

## PVC Life Cycle Inventory

Industry supports the concept of Life Cycle Inventory (LCI) evaluation of materials in order to highlight possible improvements. An eco-profile report of PVC resin was published in 2001 and a further edition will be produced in 2006.

## PVC manufacturing

The first stage in the life cycle 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 plants in Europe fully complies with the ECVM Charter. The environmental criteria are in line with the “Best Available Technique” (BAT) as adopted by the OSPAR Commission.

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

PVC manufacturers commit to comply with the Emulsion PVC Charter signed in February 1999.

## Drive to improve the eco-efficiency of PVC resin, plasticisers and stabilisers manufacturing

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 economically and ecologically this is warranted.
- Review their progress towards such targets on an annual basis in their own environmental reports.

## Bisphenol A

ECVM Member Companies have committed to stop using Bisphenol A for the production of PVC resin. No Bisphenol A has been used in the PVC polymerisation reaction or as a stabiliser for the storage of vinyl chloride by any ECVM Member Company after 31 December 2001. ECVM has contacts with non members in order to ensure all PVC plants in the EU respect the same rules.

## Additives

Additives play a vital role in creating the wide range of performance characteristics, which allow the current use and 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:

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

<sup>6</sup> COM(2000)0469 26 July 2000



### Plasticisers

Plasticisers are added to PVC resin to make compounds flexible, resilient and easier to handle for a wide range of final applications.

- 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 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.

### Stabilisers

Stabilisers are added to PVC to allow it to be processed and to make it more resistant to external forces including heat and sunlight (ultraviolet rays).

The use of cadmium in all stabiliser systems placed on the EU 15 market was already phased out in March 2001. This commitment is extended to the new 10 EU countries as from end 2006.

ESPA members continue to research and develop alternative stabilisers to the widely used and highly effective lead-based systems.

ESPA will continue to produce yearly statistics showing which stabilisers are purchased by the converters and showing usage in window and profile production, pipe and cable applications.

ESPA and EuPC reaffirm their commitment to replace lead stabilisers by 2015. Based on intensive effort, the first interim target of a 15% reduction was achieved in 2004 - one year ahead of the original schedule.

Summary of targets:

- minus 15% in 2005 (achieved in 2004).
- minus 50% in 2010.
- minus 100% in 2015.

The commitment to phase out lead stabilisers by 2015 is extended to the EU 25.

No unacceptable risk has been identified in the use of recycled plastics containing cadmium and lead stabilisers which would preclude the continued recycling of PVC applications containing such stabilisers. Both these stabiliser systems will be subject to the new EU legislation - REACH (Registration, Evaluation and Authorisation of Chemicals).

Accepting recycling of applications containing cadmium and lead is the most sustainable way to avoid dissemination of these substances into the environment.

## Waste management

### EU expansion

The European Union expanded from 15 Member States in 2000 to 25 in 2004. The partners of Vinyl 2010 are not yet fully represented in the new EU member states and efforts are underway to achieve membership of the PVC value chain.

The overall commitment of 200,000 tonnes by 2010 has been maintained and extended to the new Member States, keeping in mind that experience has demonstrated that the available volumes of PVC waste are actually lower than the ones expected in 2001.

### Waste management projects

Vinyl 2010 includes a number of major projects for important final applications of PVC. These projects are the backbone of the industry's efforts to collect post-consumer PVC waste and to identify cost-efficient recycling options and outlets for recycle.

<sup>7</sup>TEPPFA: The European Plastics Pipes and Fittings Association

<sup>8</sup>EPPA: European Association of Manufacturers of PVC and Related Building Products and Window Frames

<sup>9</sup>EPFLOOR: EuPC PVC Flooring Sector Group

<sup>10</sup>ESWA: European Single Ply Waterproofing Association

**Recovynyl**

Recovynyl is an organisation that facilitates the collection, dispatching and recycling of PVC post-consumer waste from the construction and demolition sector. It involves all stakeholders from end consumers, retailers, industries and municipalities to waste management companies and recyclers. Significant progress has been made in extending the scheme from Belgium, and the Netherlands to the United Kingdom,

France and Spain. Cooperation with other Vinyl 2010 sectoral projects has also been strengthened.

**Implementation:**

On the basis of studies and extensive discussion with recyclers, waste collection companies and the sectoral groups.

**Reporting:**

An annual report will be published.

**The plastics pipe and fitting producers**, represented by TEPPFA<sup>7</sup> (EuPC sectorial association for pipes and fittings), commit to mechanically recycle increasing quantities of PVC pipes and fittings at their end-of-life. TEPPFA achieved its targets to recycle 25% of collectable available quantity of pipes and fittings waste by 2003 and 50% by 2005.

**Implementation:**

On the basis of prior experience and through start-up or expansion of new recycling schemes and improving existing recycling schemes.

**Reporting:**

An annual report will be published.

**The window frame sector**, represented by EPPA<sup>8</sup> (EuPC sector group for profiles), commits to mechanically recycle increasing quantities of PVC window frames at the end of life of this application. The commitment to recycle at least 50% of the collectable available quantity of window profile waste by 2005 was achieved.

**Implementation:**

On the basis of prior experience and through start-up of new recycling schemes and expanding and/or improving existing recycling schemes.

**Reporting:**

An annual report will be published.

**The flooring sector** is represented by EPFLOOR<sup>9</sup> (EuPC sector group for flooring). This waste stream holds particular technical challenges in recycling the end-of-life product, which is often highly contaminated. The absence of appropriate recycling capacity will prevent EPFLOOR from meeting the original interim commitment to recycle at least 25% of the collectable available quantity of PVC flooring waste by 2006. Vinyl 2010 has therefore decided to abandon the specific targets for flooring waste. However, the

commitment remains to seek ways to increase recycling of this application in line with realistic conditions.

**Implementation:**

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

**Reporting:**

An annual report will be published.

**The waterproofing membranes sector**, represented by ESWA<sup>10</sup> (EuPC sectorial association for roofing membranes), commits to recycle increasing quantities of PVC waterproofing membranes at the end of life of this application. The commitment to recycle at least 50% of the collectable available quantity of waterproofing membranes waste by 2005 was missed but volumes are growing steadily.

**Implementation:**

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

**Reporting:**

An annual report will be published.





### Monitoring of waste flows

Vinyl 2010 will from 2006 provide statistics about recycling of PVC industrial waste and post consumer waste including waste managed outside the framework of Vinyl 2010.

## Recycling technologies

### 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. A recent study shows that the proportion of production waste that is being recycled was close to 92% in 2004, representing more than 700 kt of recycling. Further improvements will automatically result from efficiency enhancements driven by market forces.

For the mechanical recycling of end-of-life PVC products, the PVC industry examines the various applications for recycling potential against the following criteria:

- Products should be easy to sort and easy to 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.

### Feedstock recycling

Feedstock recycling is a technique in principle well suited to 'PVC rich' contaminated or mixed plastic waste, such as PVC coated fabrics, automotive interior trim, cable harnesses, flooring and other composite structures. Vinyl 2010 has invested heavily in research, development and pilot and commercial scale plants. However, certain processes

using this technology have proven more challenging than expected technically and in terms of current economic feasibility. The PVC industry intends to continue investigating feedstock recycling processes and to support those that appear promising.

### 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.
- To 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.

## Social progress and dialogue

European PVC industry employers (ECVM, ECPI and ESPA) and unions (EMCEF<sup>11</sup>) signed in October 2000 a social dialogue charter on issues surrounding the sector's future and their potential social effects on employees.

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

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

The focus of activities has been to exchange information and best practices to improve social dialogue and standards of health, safety and environment in Central and Eastern Europe. Seminars have been held in Budapest and Riga. Vinyl 2010 is looking forwards to future events in continued close cooperation with EMCEF.

## MANAGEMENT, MONITORING AND FINANCIAL SCHEME

### Rationale for a financial commitment

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

### Management

The PVC industry set up the formal legal entity, Vinyl 2010, to manage the Voluntary Commitment.

The essential elements of this Commitment are verifiable objectives and quantifiable targets.

These are set out via interim deadlines to provide a staged approach to reaching the ultimate objectives.

### Monitoring and reporting

Thorough and fully transparent annual reports containing detailed results have been published from 2000 to 2006. These will be continued.

**A Monitoring Committee** composed of representatives of the European Commission, European Parliament, Trade Unions, Non-Governmental Organisations, and representatives of the four associations, was established and first met in 2003.

The Committee is headed by Professor Alfons Buekens of the Free University of Brussels. Members review the achievement of the Voluntary Commitment each year as presented in the Progress Report. Members' involvement, however, goes well beyond this, in terms of understanding in depth the technical, operational, economic and regulatory challenges faced by the programme and offering valuable advice.

An independent third party (or parties) is chosen by the Monitoring Committee to verify and evaluate achievements.

Comments and recommendations of the Monitoring Committee are published in the annual Progress Report that will be addressed to the European Union institutions. The Committee has reviewed and commented on the revision of the Voluntary Commitment as set out in this document.

<sup>11</sup> European Mine, Chemical and Energy Workers' Federation



### Financing of projects

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

### Auditing and verification

Vinyl 2010 is committed to providing detailed information and to transparency. Internationally recognised auditors are appointed and have an important role in ensuring the validity of annual statistics on:

- Collection and recycling quantities by the projects.
- Lead stabilisers.
- Financial accounts.

Annual Progress Reports are verified to ensure the validity of all statements and that the reports give an honest and true representation of Vinyl 2010's performance. The work is undertaken by an external, independent organisation specialising in this work and agreed by the Monitoring Committee. From 2000 to date DNV Consulting has carried out the verification.

On behalf of the four organisations,

**Josef Ertl, Chairman of ECVM**

**Luca Bielli, Chairman of ECPI**

**Michael Rosenthal, Chairman of ESPA**

**David Williams, Chairman of EuPC**

Brussels, 24 April 2006

## 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 website of **Vinyl 2010**, [www.vinyl2010.org](http://www.vinyl2010.org) 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 *PlasticsEurope*, the Association of Plastic Manufacturers in Europe (APME). Its membership includes the 11 leading European PVC producers which together account for 98% of EU 15 production of PVC resin (90% of EU 25).

Avenue E van Nieuwenhuyse 4  
B-1160 Brussels  
Tel: + 32 2 676 74 41  
Fax: + 32 2 676 74 47  
[www.ecvm.org](http://www.ecvm.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 Cortenbergh 66  
Bte 4  
B-1040 Bruxelles  
Tel: + 32 2 732 41 24  
Fax: + 32 2 732 42 18  
[www.eupc.org](http://www.eupc.org)

### The European Stabiliser Producers Association (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 Mixed Metal Solid Stabilisers Association (EMMSSA)
- European Liquid Stabilisers Association (ELISA)

Avenue E van Nieuwenhuyse 4  
B-1160 Brussels  
Tel: + 32 2 676 72 86  
Fax: + 31 2 676 73 01  
[www.stabilisers.org](http://www.stabilisers.org)

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

ECPI has nine members who are the largest plasticiser producers in Europe. These companies produce almost a million tons of plasticisers annually. Plasticisers are esters (mainly phthalates) which are generally used in the production of flexible plastic products, predominantly PVC.

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

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