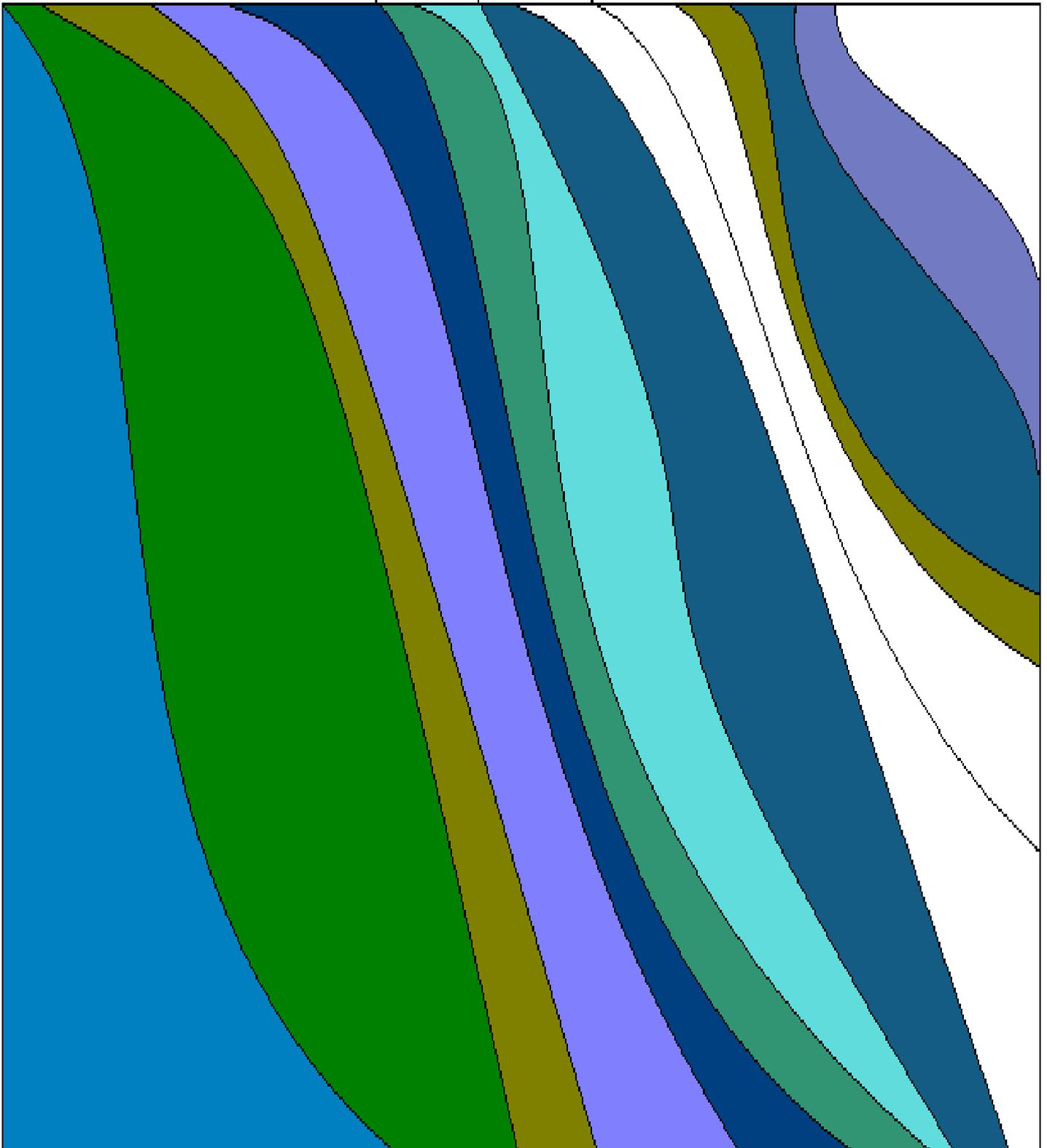




# Progress Report 2009

The annual progress report for 2009 for the Australian PVC Industry's Product Stewardship Program



# PVC Product Stewardship Program

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## Foreword

For the purpose of this document, the Australian PVC industry is the Vinyl Council, its member companies and other PVC companies which are Signatories to this Program.

Signatories to the Product Stewardship Program (PSP) are required to supply data for analysis and monitoring by the Program's Technical Steering Group for preparation of the Program's annual progress reports and to show evidence of meeting the Program's commitments.

In 2009 there were 29 Signatories to the Program (see page 15). Of these, one Signatory, did not engage in the data collection process and therefore did not fulfill the obligations of being a Signatory. Their ongoing status as a Signatory has been considered by the Technical Steering Group in 2010 and the company was in the process of demonstrating compliance at the time of publication of this report.

The relevance of each Commitment to each Signatory varies depending on whether they are a raw material supplier, compounder or converter (including importers of finished product) and the type of product produced or supplied. Refer to Appendix 1 for a summary of the Commitment relevance by Signatory.

## Significant developments in 2009

- Introduced a new target for VCM emissions from Australian resin manufacturing of 30 grams per tonne of PVC produced. The Australian resin manufacturer met this target in 2009.
- The phase out of the use of lead stabilisers from product by end 2010 is well advanced. Lead stabiliser use by Signatories has been reduced 95 per cent between 2005 and 2009. One more Signatory has completed the phase out from its products during 2009.
- Australian PVC pipe standards are progressively being amended to reflect the voluntary removal of lead stabilisers from pipe products.
- Seven new Signatories joined the Program in 2009.
- Environment Management commitment extended to encourage Signatories to embed Program commitments in their business management systems
- New commitment on mercury avoidance in the supply chain drafted.
- Forums with stakeholders were conducted in Canberra, Sydney and Melbourne to share information and receive feedback.

## Glossary

**ARFA:** Australian Resilient Flooring Association

**BBP:** Butylbenzyl phthalate

**Converter:** a manufacturer of PVC product from resin or compound.

**DBP:** Dibutyl phthalate

**DEHP:** Diethylhexyl phthalate

**DIDP:** Diisodecyl phthalate

**DINP:** Diisononyl phthalate

**EMS:** Environmental Management System

**MRF:** Materials Recovery Facility

**NPC:** National Packaging Covenant

**The Program:** the Product Stewardship Program, signed by members of the Australian PVC industry.

**Phthalate Plasticiser:** Softeners from the phthalate family of chemicals added to PVC resin to impart softness and flexibility.

**PIPA:** Plastic Industries Pipe Association

**PVC (Vinyl):** Polyvinyl chloride

**Signatories:** the members of the Australian PVC industry who have signed the Program as an indication of their Commitment to product stewardship.

**Stabiliser:** A compound used to improve the thermal stability during processing and the heat and/or UV stability of the end-use product.

**Stakeholders:** The PVC industry, its employees, suppliers and customers, the local and general communities, consumers, government and regulators, and any other groups significantly impacted by the industry.

**VCA:** Vinyl Council of Australia

## Executive Summary:

### *Product Stewardship: an integral part of business.*

PVC products add significant benefit to society, including environmental benefit, as a function of their excellent performance, durability and affordability. However, as with any manufactured product, there are impacts which need to be understood, characterised and addressed along the PVC product life cycle. The Australian PVC industry established its Product Stewardship Program in 2002 as a framework for voluntary initiatives it can undertake to address environmental and health issues associated with the life cycle of PVC.

Now in its eighth year, the program continues to deliver tangible benefits for Signatory companies by facilitating:

- Measurement of the progress in achieving commitments.
- A focus on encouraging end-of-life product management and life cycle thinking.
- Integration of commitments and initiatives in Signatories' business management, and
- Recognition by external stakeholders of the value of the program.

The Product Stewardship Program is a series of commitments that bind the Signatories to deliver specific outcomes. The commitments are progressively reviewed and updated annually in a manner consistent with our understanding of the values and expectations expressed by the general community.

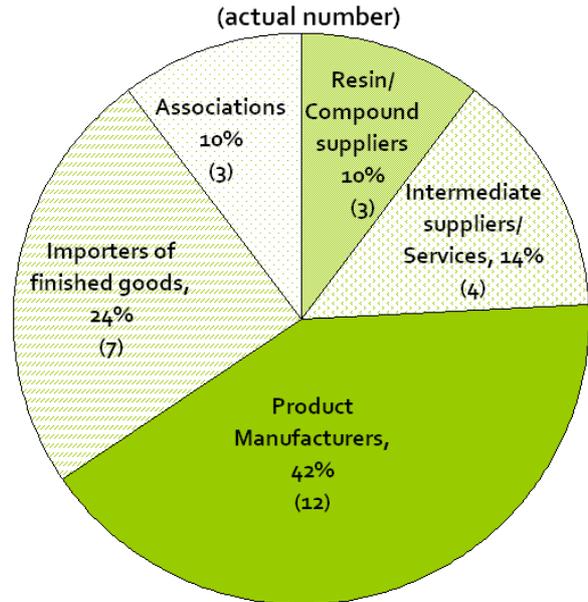
The Product Stewardship Program is focused on continuous improvement with commitments progressively upgraded. For example, in 2009, the standard for maximum VCM emissions was lowered from 50 grams per tonne of PVC produced to no greater than 30 grams per tonne of PVC.

The recent decision of the Green Building Council of Australia (GBCA) to revise its approach to PVC in the Materials Category of the Green Star building rating tool, recognised the progress of the Australian PVC industry to improve the environmental performance of PVC products, achieved in part through the outcomes of this voluntary Product Stewardship Program.

PVC has broad applications in manufacturing, and it was pleasing to welcome as Signatories in 2009 the **Australian Resilient Flooring Association (ARFA)**, with five of its members signing up to the Program, and later in the year, resin trader **Ubique**.

The Technical Steering Group has met quarterly and has been actively supported by the NSW Department of Environment and Climate Change, and the Australian Government Department of Water, Environment, Heritage and Arts. Sustainability Victoria and the Green Building Council of Australia were observers to the

## Category of Signatories,% of total



Group and Program throughout 2009. We thank these key stakeholders for their time and valuable input into the program.

Looking to the future, the Product Stewardship Program continues to adapt to meet industry needs and community expectations. In 2009, the issue of potential mercury emissions from production processes was examined in preparation for the introduction of a mercury avoidance commitment in 2010.

**George Macovaz** — Chairman, Technical Steering Group.



Issue	2009 Commitment	2009 Progress	2010 Commitment
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### 1: Production and Storage

VCM in finished resin	Residual VCM in finished resin powder not greater than 1ppm.	Achieved by 14 out of 19 relevant Signatories.	Ongoing
VCM emissions resulting from local resin manufacturing.	VCM emissions no greater than 30g/tonnes PVC.	Achieved. Emissions of less than 29g/tonnes PVC as at 30 June 2009.	Ongoing
Environmental management systems at manufacturing and storage sites.	Work towards reaching or exceeding the industry's Minimum Acceptable Standard. 85% of the terms of the Standard to be met by the end of 2009 for Signatories not meeting the Standard as at end 2008.	19 of 25 Signatories met or exceeded 85% of Minimum Acceptable Standard. Five Signatories were non-compliant, but were working towards improving their environmental management systems. One failed to report.	Ongoing. All of the terms of the Standard to be met by the end of 2010 for Signatories not meeting the Standard as at end 2009.
	Show that the Program's Commitments are embedded into companies' Business Management Systems.	16 Signatories indicated that the program commitments were embedded in their Company Business Plan.	Ongoing
Mercury Avoidance	N/A	N/A	Verify via suppliers that imported VCM or PVC resin is sourced from mercury-free processes.

NEW!

### 2: Heavy Metal Additives

Code of Practice	Adhere to the industry Code of Practice for use of lead and cadmium in PVC products in Australia.	All, but one Signatory, for whom it is relevant confirm adherence to the industry Code of Practice.	Ongoing
Cadmium use	Maintain Commitment to avoid the use of cadmium stabilisers.	No report of cadmium use by Signatories.	Ongoing
Lead use	Phase out the use of lead stabilisers in all applications by 2010.	<b>Pacific Plastic</b> completed phase out in 2009.  Remaining Signatories are on track to meet target phase out of 2010.	Complete the phase out in all applications by 2010.
Pigments	Substitute lead, cadmium & hexavalent chrome pigments by 2010, where technically feasible and alternatives are available.	Only three Signatories continue to use them and they are working towards phasing them out. One of these reported the use of hexavalent chrome in 2009.	Ongoing.
Other additives	Monitor any pertinent overseas developments.	Monitoring maintained.	Ongoing.
Open Disclosure	Provide information on additives used in PVC products or components to stakeholders upon request.	Implemented by most Signatories. Over 70% of Signatories now have a specific system in place to record and respond to such requests.	Ongoing.

Issue	2009 Commitment	2009 Progress	2010 Commitment
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### 3: The use of Plasticisers

Phthalate plasticisers	Implement the industry Policy on Plasticiser Use.	Eight of 11 relevant Signatories confirmed adherence.	Ongoing.
	Share relevant information with NICNAS.	Dialogue maintained with NICNAS.	Ongoing.

### 4: Waste Management

National Packaging Covenant (NPC)	All relevant Signatories submit waste management Action Plans under the NPC and maintain compliance with NPC obligations.	All relevant Signatories (four) are signed up and action plans lodged.	Ongoing.
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Recycling	Implement the <b>Vinyl-2-Life</b> action plan.	Most actions completed and new actions have been set (refer Appendix 2).	Ongoing.
	Monitor overseas developments.	Information on recycling developments overseas shared with Signatories and TSG.	Ongoing.

Consumer responsible care	Provide information to end consumers on management options for end-of-life PVC.	13 Signatories reported compliance using a range of methods to provide information to end consumers. Other Signatories are working towards compliance.	Ongoing.
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Life Cycle thinking	Consider whole-of-life in the development of new products.	Signatory initiatives have embraced life cycle thinking as part of their environmental framework. Companies are becoming more familiar with the life cycle assessment tools that are available.	Ongoing.
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### 5: Research

Research	To monitor national and international scientific research and share pertinent information with Signatories and stakeholders.	Information on a range of issues and matters was shared with Technical Steering Group members and/or Signatories (refer page 16)	Ongoing.
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### 6: Public Reporting

Performance against Commitments	Publish 2009 annual performance report by 31 August 2010.	Not achieved. Published in October 2010. Report verified by independent third party. Audit statement provided.	Publish 2010 annual performance report by 31 August 2011.
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PVC life cycle impacts	To publish annual product stewardship issues review.	Review for 2009 published in this document.	Ongoing.
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Review implementation and effectiveness of the product stewardship program.	Complete a review by end 2012 and publish recommendations by end March 2013.	N/A	Ongoing.
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## Commitment one: Production and Storage

Residual VCM in finished resin powder (including imported by traders and converters) not greater than 1 part per million in 99% of all resin batches tested.

VCM emissions associated with local PVC resin manufacturing no greater than 30g / tonne PVC.

Encourage and support advances in environmental management of Signatory operations. All Signatories to work towards reaching at least 85% of the Minimum Acceptable Industry EMS Standard by end 2009.

Embed Program commitments in business management.

## Vinyl Chloride

Vinyl chloride monomer (VCM), a flammable, carcinogenic substance, is the key raw material used in the manufacture of the polymer, polyvinyl chloride (PVC). VCM is not manufactured in Australia. The local PVC resin manufacturer in Australia - Australian Vinyls Corporation - imports its VCM as a liquefied gas under pressure.

While VCM is a hazardous substance, once polymerised to PVC resin the polymer is essentially inert and does not revert back to the monomer. During manufacturing, VCM may be emitted from the plant in accordance with regulatory licence limits; fugitive emissions may potentially occur.

The VCM emissions standard was originally set in the Product Stewardship Program at less than 50 grams of VCM emitted (both licensed and fugitive emissions) per tonne of PVC. This was reviewed in 2009 following a recommendation from the 2008 progress report auditors as Australian Vinyls Corporation, to whom the commitment specifically relates, has consistently met the standard for the past few years.

A new commitment was agreed early in 2009 reducing the VCM emissions standard to less than 30 grams per tonne PVC produced. Australian Vinyls' reported VCM emissions were 28.11g /tonne PVC for the year to 30 June 2009.

## Residual VCM

Minute amounts of unreacted VCM may remain in the resin when it leaves the resin plant. This is referred to as residual VCM. International, voluntary industry standards require PVC resin to have no more than 5 parts per million (ppm) VCM in final resin to be used in general products, and less than 1 ppm in resin to be used in food contact and medical device applications.



Such standards protect the health of workers from exposure to VCM during conversion of the resin into finished goods, as well as consumers of these products. VCM should be undetectable in final products.

Under the Product Stewardship Program, the Australian industry has set a standard that the concentration of residual VCM in finished resin powder destined for any application be no greater than 1 ppm. In 2009, we reviewed the wording of the commitment and provided clarity around compliance requirements and documentation.

Fourteen Signatories for whom the commitment was relevant, confirmed compliance. Two Signatories were found to be non-compliant in that documentation confirming residual VCM in resin purchased could not be supplied. Three Signatories for whom the commitment was relevant failed to report. All five will be followed up in 2010 and encouraged to comply.

**ACTION:** Follow up non-compliant Signatories.

## Environmental Management Systems

An Environmental Management System (EMS) is a tool for managing the impacts of an organisation's current and future activities on the environment. It is a structured approach to planning, implementing and continuously improving environmental protection measures.

The objective of including an EMS commitment in the Product Stewardship Program is to demonstrate environmentally responsible manufacturing, storage and transport practices by the PVC industry.

Since 2005, Signatories have been encouraged to work progressively towards establishing and implementing an EMS for their operations. A *Minimum Acceptable Standard for Environmental Management* was developed to guide them.

Under the Product Stewardship Program, Signatories commit to having their Environmental Management

System meet one or more of the following standards:

- ISO14001
- Chemical Industry's *Responsible Care* Program
- Australian PVC Industry *Minimum Acceptable Standard*

For those Signatories with Environmental Management Systems that do not yet meet the PVC Industry Minimum Acceptable Standard and are not Signatories to Responsible Care or certified to ISO14001, it is required that these Signatories take the necessary steps to achieve:

- 85% of the PVC industry Minimum Acceptable Standard requirements by the end of 2009
- All of the PVC Industry Minimum Acceptable Standard by the end of 2010

In 2009, it was agreed that Signatories are expected to show that the Product Stewardship Program commitments are embedded into their company's current Business Management Systems.

## 2009 Performance

For the reporting year of 2009, of 25 reporting Signatories, 19 reported that they met or exceeded the 85% requirement of the PVC Industry Minimum Acceptable Standard. Of these, seven were ISO 14001 accredited and three were Responsible Care signatories. Five companies are non-compliant with the Minimum Standard and one failed to report.

However, one of these non-compliant Signatories was in the process of achieving ISO accreditation.

Previous annual reviews and verification audits have indicated that a small number of companies continue to have difficulty implementing a formal EMS, although reporting their commitment to working towards improving their environmental management. During 2010, the Vinyl Council will try to assist these non-compliant companies and those not yet fully compliant with the EMS Minimum Standard to reach that goal.

In 2009, we extended the EMS commitment, to encourage Signatories to embed the Product Stewardship Program commitments within their business management systems. One Signatory, **Armstrong World Industries**, gave presentations to member companies demonstrating how this could be achieved. The presentation outlined:

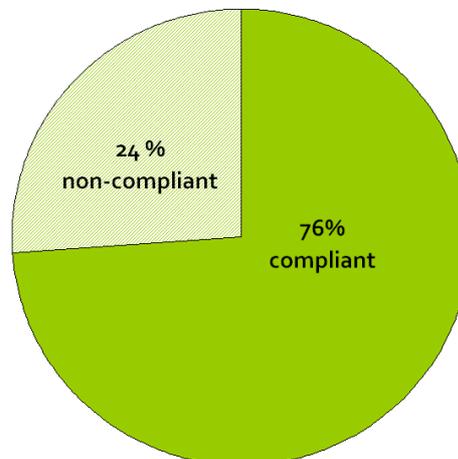
- what an EMS is comprised of and the ISO 14001 EMS certification process;
- integrating the EMS with safety and management programs;
- identification of the relevant PSP commitments and targets;
- the use of an Objectives and Targets Register;
- monitoring performance and the use of pre-purchase

checklists to prevent breaches of PSP commitments and other EMS objectives

- the benefits of the environmental focus for the business.

Nearly 65% of companies indicated that their Product Stewardship commitments were embedded in their company's Business Management System.

### Compliance to the 2009 EMS Standard



**ACTION:** VCA to provide support for non-compliant Signatories to achieve compliance.

**NEW!**

## Program Signatories commit to Mercury Avoidance

Signatories to the Australian PVC Industry Product Stewardship Program (PSP) are committed to removing toxic heavy metals from PVC product. During 2009, the Technical Steering Group (TSG) considered the potential for mercury emissions in the PVC life cycle. There are two possible routes for mercury emissions:

- Chlorine, which is used in the manufacture of ethylene dichloride (EDC), is produced in some plants using the older mercury cell technology. Mercury cell chlorine plants are gradually being decommissioned and replaced by mercury-free processes.
- Vinyl chloride and PVC resin can be manufactured via the ethylene route or a carbide-acetylene route. The latter, predominantly found in China, uses mercury chloride as a catalyst.

At the end of 2009, the TSG developed a new commitment for Signatories to ensure avoidance of mercury in the PVC supply chain for PVC products in Australia.

The Signatories to the PSP have agreed from 2010 to verify via their suppliers that imported VCM or PVC resin is sourced from mercury-free processes.

## Commitment two: Use of Heavy Metal Additives

Adhere to the industry Code of Practice for safe use of additives.

New Signatories to the Program who are using cadmium agree to a specific phase-out date upon signing.

Maintain commitment to avoid the use of cadmium.

Phase-out the use of lead stabilisers with target phase-out dates of 2008 for pipes and fittings and 2010 for other applications.

Substitute lead, cadmium and hexavalent chrome pigments by 2010 where technically feasible and alternatives are available.

Monitor any pertinent overseas developments.

Heavy metal stabilisers, including Lead and Cadmium compounds have for many years been used as additives to PVC compounds to provide UV and heat resistance, making the product more resilient. The use of these metal compounds has been progressively phased out because of community concerns over their health, safety and environmental impacts.

The Product Stewardship Program binds Signatories to:

- avoid the use of cadmium stabilisers;
- phase out the use of lead stabilisers in all applications by the end of 2010; and
- substitute lead, cadmium and hexavalent chrome pigments, where technically feasible, by the end of 2010.

## Industry Code of Practice

All but one of the relevant Signatories confirmed their company adherence to the industry Code of Practice for the use of heavy metal stabilisers and pigments. One company has not demonstrated awareness of the Code of Practice. The Vinyl Council will discuss this with the company concerned.

## Phase out progress

The phase out of cadmium based stabilisers by PSP Signatories was completed in 2004.

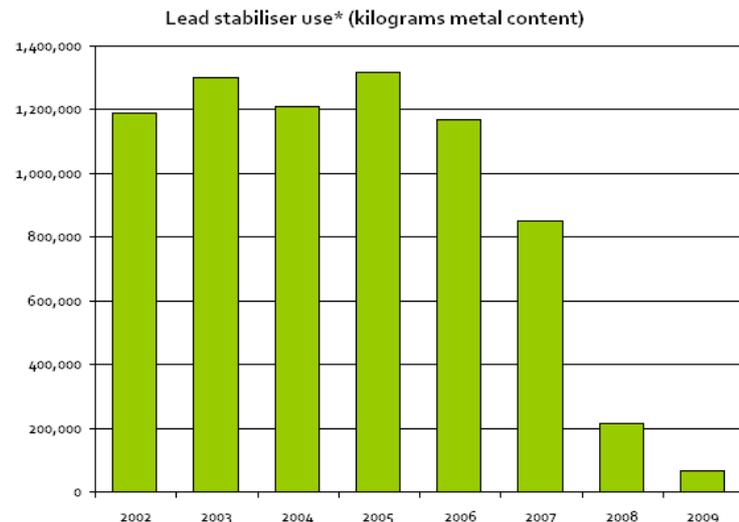
The progressive phase-out of lead based stabilisers by Signatories is continuing with consumption per annum of lead based stabilisers equivalent to 65,195 kg of metal content in 2009. This represents a reduction of 150,000 kg from 2008 levels and a 95 per cent reduction over the period 2005 – 2009.

In 2009, there were five product manufacturers who declared usage of lead stabilisers but all confirmed they were on track to complete the phase out of lead by end 2010.

**Pacific Plastics (QLD)** ceased the use of lead stabilisers by the end of 2009. One pipemaker which had confirmed phasing out lead stabilisers by the end of 2008, found it was left with a small volume of lead stabiliser stock in 2009. Some of this they were able to on-sell, and the remainder was mixed with end-of-life pipe waste and used as a recycle in foam core pipe, thus preventing its disposal to landfill.

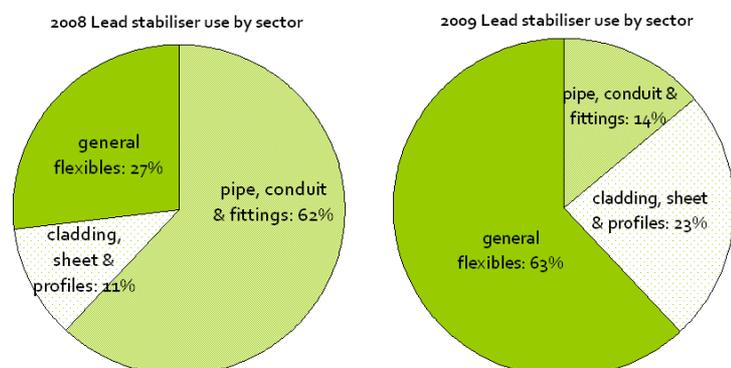
The pipe industry has been progressively amending relevant pipe standards to include the removal of lead.

Similarly, the Electric Conduit Standard is being revised to detail the exclusion of lead and cadmium.



\* To avoid double counting, the figures are derived from data reported by converters for products sold on the local and export markets, and stabilisers reported by Signatory compounders to non-Signatory converters.

**ACTION :** Signatories to check product formulation specifications, technical data sheets and other relevant document are updated to remove references to lead use.



## Alternative stabilisers

Alternative stabiliser compounds being used in place of lead and cadmium compounds include calcium zinc, tin and organic based stabilisers. These have been described in more detail in previous reports. Some stabiliser alternatives have undergone official scientific risk assessment by overseas government authorities:

**Calcium zinc** compounds, according to the European Commission's risk assessment, have no health or safety issues related to their use in PVC products.

**Tin** compounds were found to be safe for use in rigid PVC applications under the European Commission's risk assessment; however, some concerns have been identified for flexible PVC applications (flooring and wall-coverings) in relation to indoor air quality. Australian Signatories to the Product Stewardship Program manufacturing or supplying these specific applications have confirmed they do not add tin stabilisers to their products.

The base organic molecule in **organic stabiliser** systems has been listed on the EU positive list for drinking water.

## Pigments

Signatories have committed to substitute lead, cadmium and hexavalent chrome pigments where technically feasible by end of 2010. During 2009, only three of the Signatories used them and they have committed to substituting these where technically feasible and alternatives are commercially available.

## Open Disclosure

Under the Open Disclosure commitment, Signatories agree to provide general information on the additives used in their PVC products or components, to stakeholders upon request. This will include a list of all hazardous substances intentionally added. However disclosure of exact amounts of each additive used is not required under this commitment as it is proprietary, commercially sensitive information.

The 2008 independent audit identified that where companies did not have a formal reporting system in place in relation to this commitment, it resulted in a number of 'partial compliances' being recorded. During 2009, the VCA reiterated to Signatories that to demonstrate compliance, Signatories should show evidence of a system or process to track receipt of and responses to requests, and of staff training and awareness of this commitment.

Over 70 percent of Signatories reported that they had a system in place in 2009. Most Signatories have used their existing, relevant internal processes to deal with any requests for information. Suppliers of raw materials and additives continue to provide Material Safety Data Sheets (MSDSs) with their products and increasingly these are available on company web sites.

**Iplex Pipelines** uses its website to provide a comprehensive list of products which contain hazardous substances or dangerous goods, linked to the suppliers' MSDSs.

## Commitment three: Use of Plasticisers

**Implement the industry policy on phthalate use.**

**Share relevant information with the National Industrial Chemicals Notification and Assessment Scheme (NICNAS).**

Plasticisers are additives that, when mixed into PVC resin, make the product softer and more flexible. PVC is then able to be used in such applications as resilient flooring, electric cable insulation, hoses, packaging films, clothing and footwear, PVC toys and medical devices.

The choice of plasticiser is usually based on particular processing and performance characteristics required for the product. The most commonly used type of plasticisers are a group of substances called phthalate esters. These have been in use for around 70 years.

Each type of phthalate ester has a unique chemical profile which reflects the suitability for the application. The most common phthalate plasticisers used in products in Australia are

- DIDP (di-isodecyl phthalate);
- DINP (di-isononyl phthalate); and
- DEHP (di-2-ethylhexyl phthalate), sometimes known as DOP (di-octyl phthalate).

In order to provide flexibility to the polymer's molecular structure, the phthalate plasticiser is not tightly bound into the PVC molecular chain, creating the potential for migration of minute amounts of plasticiser to the surface. Consequently, the potential health and environmental effects of phthalates have been extensively studied over the past 40-50 years. Details of the major studies have been reported on in our previous reports.

The areas of greatest concern relate to the use of phthalates in children's toys and medical devices, and the potential for phthalates to interfere with the human endocrine system. Each phthalate ester has its own toxicity and safety profile; the phthalates of potential concern have been identified as those with a straight chain carbon backbone of 4-6 carbon atoms. DEHP is one of these.



## Scientific news in 2009

The Vinyl Council and Signatories have continued to monitor scientific developments and consider the implications of findings for the use of phthalates. Some of these developments during 2009, included:

- a study by Meeker *et al*<sup>(1)</sup> which examined DEHP metabolites in male urine samples and found the higher the level of metabolite, the lower the levels of estrogen and testosterone. However, the authors said it was difficult to draw cause-effect relationships, and that other factors may contribute.
- Herr *et al*<sup>(2)</sup> found no link between DEHP exposure and male reproductive toxicity from analysis of concentrations of DEHP metabolites in urine and semen samples taken on the day of an examination.
- a paper by Swedish and U. S. scientists<sup>(3)</sup> suggested that children who live in homes with vinyl floors are more likely to have autism and the autistic children were more likely to have asthma. The scientists associated the findings to phthalate plasticisers in the flooring being emitted and carried on dust; however, they said the findings "should be weighed carefully and warrant further study". Other scientists responding to this study cautioned that the study had too many limitations to draw conclusions and suggested that new studies be designed to look for a connection between autism and indoor air pollutants. The American Chemistry Council pointed out that emissions of phthalates from vinyl flooring would be extremely low. The compounds are heavy molecules with low volatility, so they do not tend to evaporate, nor release particles into dust from wear and tear.
- a study from US researcher, Shanna H. Swan<sup>(4)</sup> claimed higher concentrations of metabolites of two phthalates, DEHP and DBP (dibutyl phthalate) were associated with less male-typical behavior in boys evaluated via a standard play questionnaire. The study focused on a small sample of mothers who gave urine samples during pregnancy and were then surveyed about their children who were between the ages of 3 ½ to 6 ½ years at the time of the survey. Swan hypothesized that prenatal phthalate exposures may lower fetal testosterone production during a critical window of development affecting the masculine brain development. However, a single measurement of phthalate concentration during pregnancy is regarded as a limitation in the study in forming any definite conclusions. The authors themselves acknowledged their results need to be confirmed and the results were "not straightforward".

The Vinyl Council issued a statement about the Swann study following media coverage in Australia. We said it was important in light of debate about the methodology of Swan's study for additional scientific experts to consider the robustness of this study.

## References

- (1) Meeker *et al*/Journal of Andrology Dec 2008
- (2) Herr *et al*/International Journal of Hygiene & Environmental Health Dec 2009
- (3) Weiss *et al*/University of Rochester/Environmental Health News Mar 2009
- (4) Swan *et al*/International Journal of Andrology Nov 2009

## Overseas regulatory developments

**Medical products:** From 2010, there will be an obligation in Europe under European Commission Directive 2007/47 to label medical devices containing any phthalates classified as carcinogenic, mutagenic or a reproductive toxin (CMR). PVC is not specifically mentioned in the Directive and, to our knowledge, there are no Directives restricting the use of PVC in medical devices in Europe. The clause only applies to CMR 1 or 2 phthalates, which, in practice, means DEHP.

**REACH – the European chemical regulatory framework:** In mid 2009, the European Chemicals Agency (ECHA) recommended that seven chemical substances should not be used without specific authorisation and added them to the REACH Candidate List of "substances of very high concern". The phthalates DEHP, DBP and BBP (butyl benzyl phthalate) are included on the grounds that they are deemed toxic to reproduction. Substances on the Candidate List will in future only be able to be used within the EU when "authorised" for specific purposes.

The two most commonly used phthalates, DINP and DIDP, are not on the Candidate List and are not classified in the EU.

**SCENIHR Opinion on Medical Devices:** In light of new information on exposure to DEHP that had become available over the last 7-8 years, the European Commission asked a new scientific committee to review the safety of DEHP in medical devices once more. This committee, the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR), published its Opinion in 2008.

The new Opinion stated clearly that "there is limited evidence suggesting a relation between DEHP exposure and some effects in humans" and "so far, there is no conclusive scientific evidence that DEHP exposure via medical treatments has harmful effects in humans."

However, it also expressed some concerns. The Opinion stated that, even in the absence of clinical or epidemiological evidence of harmful effects in humans, "there is a reason for some concern for prematurely born male neonates". Other patient groups such as male fetuses and male infants of pregnant women, lactating women exposed to DEHP and trauma patients who undergo blood transfusions may also be at risk. The reason for the concern for these patient groups is that the level of DEHP exposure from medical devices can exceed the exposure limits determined (with an appropriate safety margin) from dose levels that result in reproductive effects observed during animal studies.

The European Commission also wanted to know about possible alternative plasticisers that can be used to

replace DEHP. Consequently, eight alternative plasticisers were evaluated including non-phthalate plasticisers, certain citrates and adipates. It was difficult for SCENIHR to conclude anything decisive about the alternatives. For some of the alternatives "a complete evaluation could not be performed due to lack of data on either toxicity or exposure"; some alternatives "could be suitable to replace DEHP in certain medical devices"; and for others "it may be difficult to achieve the same functionality as for PVC plasticised with DEHP". Its overall conclusion on the possible alternatives to DEHP was that "the risk and benefit should be carefully evaluated".

**US developments:** The U.S. Environmental Protection Agency's (EPA's) current management plan includes eight phthalates: DBP, DIBP (diisobutyl phthalate), BBP, DnPP (di-n-pentyl phthalate), DEHP, DnOP (di-n-octyl phthalate), DINP, and DIDP. The EPA intends to initiate action as part of a coordinated approach with the Consumer Product Safety Commission and the Food and Drug Administration to address the manufacturing, processing, distribution in commerce, and/or use of these eight phthalates.

The Action Plan is intended to describe the courses of action the EPA plans to take. It is not a final determination, nor represents final action. Depending on the nature of its final determination about the eight phthalates, different approaches to risk management may be considered by the EPA.

The Vinyl Council and its Signatories will continue to monitor these developments.

**Australian Assessment of DEHP:** In 2006, the National Industrial Chemicals Notification and Assessment Scheme (NICNAS) declared nine phthalates as Priority Existing Chemicals (PECs) and subject to risk assessment to determine their suitability in applications where there was concern of potential exposure. This considered two exposure scenarios:

- The use of phthalates in toys and childcare articles by children
- The use of phthalates in cosmetic products by the general population.

A phased release of risk assessments by NICNAS for the nine PECs is planned. The first draft risk assessment was released in January 2010 for DEHP.

The DEHP Risk Assessment found:

- Worst case estimates of the margin of exposure (MOE) for use of DEHP in children's toys and childcare articles indicate that the risk of reproductive toxicity in children from the use of these products containing DEHP is a concern.
- Oral exposure to DEHP through mouthing of toys and childcare articles is the major route of exposure to DEHP.
- Reproductive developmental toxicity in children is a serious long term health effect.
- Currently there are no restrictions in Australia on the use of DEHP in children's toys and childcare articles

and there is a potential for introduction and subsequent exposure of children to DEHP via these products.

The Report recommended that the Australian Competition and Consumer Commission consider appropriate regulatory measures to limit exposure to DEHP resulting from the use of the DEHP in toys and childcare articles, where significant mouth contact may occur.

The ACCC subsequently declared that toys and childcare articles intended for use by children up to and including 36 months of age contain no more than 1 percent by weight DEHP. Restrictions have also been placed on the use of DEHP in cosmetics.

It is unlikely that DEHP is used in toys sold in Australia and it is not known to be used in cosmetics. In 1998, the Vinyl Council and the Australian Toy Association recommended toy distributors and retailers in Australia avoid phthalate plasticised products .

NICNAS are continuing their program of risk assessments with that of DINP due in late 2010, followed by DBP and BBP.

## Stewardship Policy for use of phthalates in PVC products

Signatories to the Product Stewardship Program commit to adhere to the policy for the use of phthalate plasticisers and, in doing so, acknowledge their responsibility to use these plasticisers only where they are reasonably and properly regarded as safe. Signatories will cease the use of a phthalate plasticiser in any application where available scientific evidence shows it to have unacceptable health or environmental impacts.

There were 11 Signatory companies that reported the use or supply of phthalate plasticisers. Of these, one failed to confirm adherence to the policy. An additional two Signatories did not report the use or supply of phthalate plasticisers nor confirmed adherence to the policy. The exceptions will be followed up in 2010 to clarify their response and identify any issues. The Vinyl Council does not believe these Signatories are contravening the intent of the Policy.

The policy will be reviewed, and if necessary, revised in 2010 to reflect the outcomes of the scientific risk assessments currently being conducted by NICNAS.

Taking into consideration recent scientific and regulatory developments as we understand them, the Vinyl Council and Signatories continue to believe that phthalates are being used safely by the industry in Australia.

**ACTION:** Review the Policy for the use of plasticisers. Clarify why relevant Signatories have not confirmed adherence to the Policy.

## Commitment four: Waste Management

All relevant Signatories to have submitted waste management Action Plans under the NPC and maintain compliance with NPC obligations.

Ongoing implementation of Vinyl-2-Life Action Plan for improving recovery and recycling of PVC waste.

Monitor overseas developments.

Provide information to end consumers on reuse, recycling and safe disposal options or end-of-life PVC.

Consider whole-of-life in the development of new products, taking into account end-of-life issues and waste management options.

Any Signatory engaged in the packaging supply chain is required under the Product Stewardship Program to be a signatory to the National Packaging Covenant (NPC), to submit Action Plans in accordance with the Covenant and to maintain compliance with NPC obligations.

The NPC is a collaborative agreement between governments and industry, based on the principles of product stewardship. It is designed to minimise the environmental impacts arising from the disposal of used packaging; conserve resources through better design and production processes, and facilitate the re-use and recycling of used packaging materials.

All the relevant Signatories in relation to PVC packaging have re-signed to the NPC. These are the Aperio Group, Plaspak Peteron and Pliant Corporation, who are all packaging manufacturers, and Australian Vinyls as a resin supplier to the industry. Examples of their packaging and recycling initiatives include:

**Aperio Group** has delivered continued reduction in scrap PVC going to waste under its Action Plan. An estimated 99 tonnes was recycled internally or sold as recyclate. A focus on dematerialisation enabled downsizing to be achieved in some cartons and cores resulting in the saving of additional packaging.

**Australian Vinyls** has focused on improving data capture and increasing recycling of manufacturing waste. It reduced waste sent to landfill by 8 percent over 12 months to 30 June 2009.

**Plaspak Peteron** reprocessed 120 tonnes of factory waste and diverted 96 tonnes from landfill. This included 30 tonnes of PVC scrap sold to a company that reclaim and recycle PVC waste.

**Pliant Corporation** focused on reprocessing factory waste and the recycling of cardboard. As a manufacturer of food contact film there was no opportunity for recycling post consumer waste.

## Industrial Recycling

Signatories have reported continuing effort to recycle, beginning with resource efficiency within the production process to minimise waste generation and then, where waste is unavoidable, the collection of waste product for reprocessing. Reprocessing of manufacturing waste has become a standard manufacturing practice. A total of 15 Australian based manufacturers reported the reprocessing of their own factory waste, with 8,024 tonnes reported as being reprocessed in 2009.

Signatories reported that 781 tonnes of post-industrial waste was diverted from landfill, including waste sent to a third party for recycling.

In addition to this a further 243 tonnes of externally sourced, post-industrial waste and 365 tonnes of post-consumer waste was reprocessed by Signatories. This recycling by Signatories represents further diversion of waste from landfill which is the principle objective for effective waste management and waste minimisation programs.

A number of Signatories have reported achievements in various aspects of waste recycling:

**Armstrong World Industries** reported the reprocessing of 111 tonnes of post-consumer waste, including kerbside-collected PVC cordial bottles. The material is granulated and micronized and substituted for virgin PVC resin in flooring applications. They also recycled small volumes of externally sourced post-industrial PVC waste and post-consumer HDPE supermarket shopping bags, into new flooring product. Armstrong encourages use of recycled waste water, wrapping paper/cartons and recycled plastic pallets in their operations and sends waste plant & office paper, wood and metal for recycling.

**Australian Plastic Profiles** rework all internal PVC waste into the same finished product or micronise it for use in APP foam core pipe products. A recent initiative is to divert PVC dust collected into finished product instead of sending it to landfill. Other waste minimisation initiatives include the separation and recovery of all paper/cardboard and metal waste.



**Pipemakers Australia** report that their scrap PVC is granulated and re-used in the manufacture of non-pressure products diverting it from landfill, reducing waste costs and contributing to the company's overall recycling policy. Pipemakers are prepared where feasible to recycle scrap from construction sites or landfill operations.

**Tech Plas Extrusions** have developed products that use 100% recycled material including storm water pipes and drainage channels, which use PVC post industrial waste sourced externally.

**Tyco Water** reported that all PVC pipe factory waste is reprocessed on site and no PVC is sent to landfill from their operation.

**Vinidex** reported that post-consumer and post-industrial materials are used in the manufacture of some products where appropriate and that it actively supports the industry's pipe recovery program, overseen by PIPA.

## Vinyl-2-Life Waste Action Plan

The Vinyl-2-Life waste action plan is about giving a second life to vinyl products that have served a useful first life. The plan was developed in 2006 based on the key findings of the 2005 PVC Waste Audit commissioned by the Vinyl Council. It sets out a series of goals and actions to improve or facilitate recovery and recycling of key PVC waste streams. Progress against the plan is reported quarterly to the Technical Steering Group and actions are revised or new actions developed as the plan progresses.

Key achievements and developments in the program during 2009 include:

**Recovery of PVC Medical Waste:** A trial commenced in late 2008 to test the viability of collecting and recycling PVC medical devices including IV bags, oxygen masks and tubing from hospitals in the Western Health network. During 2009, PVC re-processor, SRM Plastics, was engaged and currently is collecting about 500kg of material every 3-4 weeks from Melbourne's Western and Sunshine hospitals. Regular meetings with hospital staff and the recycler are helping to resolve issues associated with logistics and contamination. Briefings have been given to medical staff at the two sites to educate those responsible for disposal of the PVC items. The VCA has been discussing with key stakeholders strategies to help scale up the trial and expand it to other hospital networks.



**Pipes and Profiles:** The **Plastics Industry Pipe Association (PIPA)** oversees the recycling of pipes and profiles in Sydney, Brisbane and Melbourne. Waste PVC pipes, off-cuts and fittings are extracted from demolition and construction waste and the recyclate is used for new pipes suitable for non-pressure applications. In 2009, a total of 323 tonnes of waste PVC pipe scrap was recovered and recycled into new PVC pipes.

**Floor Coverings:** A Vinyl-2-Life Action Plan goal is to develop and implement a voluntary scheme or initiatives aimed at encouraging higher recovery and recycling rates for end of life vinyl floor coverings.

**Armstrong World Industries** is the only company that manufactures vinyl flooring in Australia; other vinyl

flooring companies have manufacturing facilities overseas and import and distribute in Australia.

In March 2009, the **Australian Resilient Flooring Association (ARFA)** became a member of the VCA and five of its members became Signatories to the Product Stewardship Program. This has enabled us to commence discussion with a broader representation of the vinyl floor sector in Australia.

Companies have commenced activities to recover flooring waste on an individual basis, for example using bins on-site at construction projects to collect installation waste. Trials have been done on recycling this waste locally, sending it for secondary beneficial reuse in Australia, or returning it to factories overseas for recycling. Signatory, **Polyflor Ltd** is a founding member of Recofloor, the industry-funded vinyl take-back scheme in the UK.

The Council is exploring the issues and opportunities for recovery of flooring waste with stakeholders and continues to encourage development of broader initiatives with the sector.

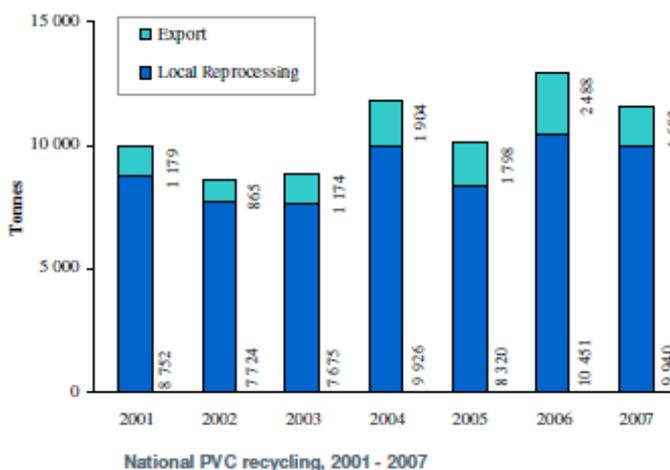


**ACTION:** Continue to explore how to obtain better data on PVC waste generation and recovery.

A summary of the activities and progress of the Vinyl-2-Life program at the end of 2009 is detailed in Appendix 2.

## Conducting Research

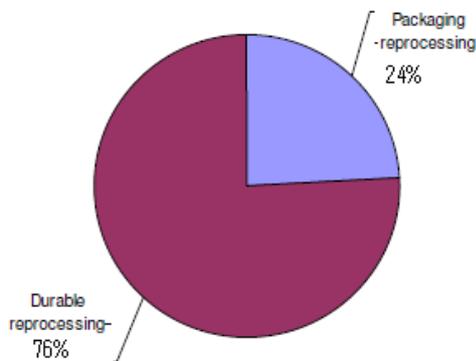
The VCA engaged Hyder Consulting to develop baseline data and information on current PVC recycling in Australia. Hyder submitted the final report in May 2009, and made presentations to the Technical Steering Group (TSG). An objective of the study was to establish robust baseline data to enable the Vinyl Council to develop targets for the Australian PVC industry. However, a number of difficulties were encountered in



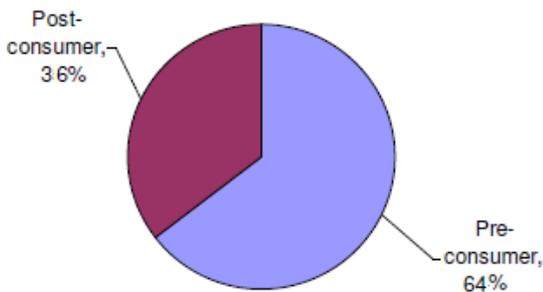
trying to obtain the data including identification of PVC products among plastic materials; and conflicting information between waste collectors and the reprocessors.

In 2007, the report found, a total of 11,623 tonnes of PVC waste was sent for recycling, either locally (85%) or overseas (15%). (Refer graph on page 13.) PVC consumption is dominated by long life applications including plastic pipes, conduits, cable-sheathing and vinyl flooring. Not surprisingly therefore, 76% of the recovered material came from durable applications; 24% was accounted for by packaging applications. However, only 985 tonnes of recycled material was sourced from the Building, Construction and Demolition sector; most of the durable PVC recovered reportedly came from the Commercial and Industrial sector.

Only 36% of the total recovered material was post-consumer with 64 percent designated pre-consumer material.



Durable and packaging split of recycled PVC, 2007



Pre- and post-consumer split of recycled PVC, 2007

In order to monitor and measure PVC recovery and reprocessing, we need to know:

- How much PVC waste is being sent to landfill;
- How much PVC waste is currently recovered and reprocessed.

The Vinyl Council has been discussing with external stakeholders how to obtain better data and an improved understanding of the volumes of PVC waste streams available for potential recovery so we can target programs more effectively to improve recycling.

## Consumer Responsible Care

In order to assist end-consumers of PVC products on how best to manage the product at the end of its life, Signatories are required to make information available to end-consumers of their products on how to safely reuse, recycle or dispose of the product.

Over half of the Signatories indicated that they fulfilled the intention of the commitment to encourage consumer responsible care through, for example:

- providing appropriate information for safe disposal methods on company websites;
- producing a Guide to the Safe Handling of PVC resin, which includes waste disposal;
- referring consumers to specific recyclers;
- promoting the Vinyl Cycle bottle recycling program; and
- reporting safety data and disposal recommendations in Material Safety Data Sheets (MSDS).

There were 10 Signatories deemed to be non-compliant; the Vinyl Council will seek to assist these Companies to achieve compliance.

## Life Cycle Thinking

Signatories are now recognising the importance of life cycle management of their products and using life cycle thinking in the development of new products. The VCA has continued to offer Signatories training on Life Cycle Management through PACIA and the Victorian EPA.

In 2009, **Armstrong World Industries** updated its "Environmental Impact Statement" which outlines the company's life cycle approach. It also conducted a project to produce a special high recycled content version of one of its products with more than 35 percent recycled content.

**Dincol Construction System** published a peer-reviewed paper in March 2009 entitled Energy Efficiency in Building Construction which examined the embodied energy of its permanent formwork wall system and the potential carbon savings of its use compared to traditional wall systems.



## Commitment five: Research

**To monitor national and international scientific research and share pertinent information with Signatories and stakeholders.**

The agenda for the Technical Steering Group meetings, held quarterly, provides the opportunity to monitor and share information on national and international developments in scientific research relevant to the potential health and environmental impacts of the PVC product life cycle.

During 2009, research or reports were shared on the following topics:

- Plasticisers and potential reproductive effects;
- The use of phthalates in medical device applications;
- Media reports on chemicals in food, cosmetics and cleaning products.
- A discussion paper on the Draft National Waste Policy Framework

In addition the following speakers made presentations at TSG meetings during 2009:

- Angela Gillman of the Department of Environment, Water, Heritage and the Arts, presented a general overview of the scope of the planned National Waste Policy.
- Peter Byron (Armstrong) provided a case study presentation on embedding the Product Stewardship Program commitments into a company's certified Environment Management System.
- Ron Mack, Technology and Innovation Advisor with CSIRO, outlined how the CSIRO is assisting Australian manufacturing industry advance international competitiveness through innovation and transformational change, including nano-technology.

The Vinyl Council shares information publicly on relevant scientific and regulatory developments via its public and members only websites.

## Commitment six: Public Reporting

**Publish independently verified annual performance report and stewardship issues review by 31 August.**

**Publish a 5 year review and recommendations by 2013.**

## Signatories

During 2009, APN, Nylex, Orica and Innua left the Program. ARFA and five of its members became Signatories and Ubique joined late in the year.

At the end of 2009 calendar year, the 29 Product Stewardship Program Signatories are:

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Aperio Group (Australia) Pty Ltd

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Australian Resilient Flooring Association (ARFA)

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Forbo Floorcoverings Pty Ltd  
Gerflor Australasia Pty Ltd  
Kenbrock Flooring Pty Ltd  
Pegulan Floorcovering Pty Ltd  
Signature Floorcoverings Pty Ltd

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Australian Vinyls Corporation Pty Ltd

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Armstrong World Industries (Aust) Pty Ltd

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Chemson Pacific Pty Ltd

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Dincel Construction System Pty Ltd

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Pacific Plastics (QLD)

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Plaspak Peteron Pty Ltd

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Plastral Pty Ltd

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Plastic Industries Pipe Association (PIPA)

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Australian Plastic Profiles Pty Ltd  
Iplex Pipelines Australia Pty Ltd  
Pipemakers Pty Ltd  
Vinidex Pty Ltd

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Pliant Corporation Pty Ltd (now trading as Berry Plastics (Australia) Pty Ltd)

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Polyflor Australia Pty Ltd

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Sun Ace Australia Pty Ltd

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Tarkett Australia Pty Ltd

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Tech Plas Extrusions Pty Ltd

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Terminals Pty Ltd

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Tyco Water

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Ubique Polymers Pty Ltd

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Vinyl Council of Australia

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Welvic Australia

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Roadshows were conducted in Sydney, Melbourne and Canberra in 2009, which provided an opportunity for external stakeholders to provide feedback on the Program and suggestions for improvement.

This 2009 annual report was published in October 2010, following a complex verification process. The annual reports include a discussion of PVC life cycle impacts, updating on developments and recent scientific findings.

## Technical Steering Group 2009

Four meetings of the TSG were conducted during the year.

TSG Members	Organisation
Chris Low	ARFA/Gerflor
Peter Byron	Armstrong World Industries
Nigel Jones Andrew Ferguson	Australian Vinyls Corporation
Alex Hruza	Chemson
Mike O'Shea	CSIRO
Greg Manning Peter Marshall	Dept of Environment, Water, Heritage and the Arts
Alan Whittle	Iplex Pipelines
Alex Young	NSW Dept of Environment & Climate Change
Paul Martonhelyi/ Nick Hayhurst	Plastral
Kevin Doidge	Polyflor
Tom Elovaris	Pliant Corporation
Ian Lilja Neil Stewart	Sun Ace
Colin Bray	Tarkett
George Macovaz	Vinidex (Chair)
Ron Guest/Barry Black Sophi MacMillan	Vinyl Council of Australia
Matthew Hoyne Stephen Dowling	Welvic Australia
Observers	Organisation
Stephen Loffler	Sustainability Victoria
Hal Dobbins/Shlomi Bonet	Green Building Council of Australia

## Verification

As in previous years, this year's report has been independently verified by Net Balance Foundation. The objective of the verification process is to provide an independent opinion on the accuracy of the data and statements made in the Report.

Net Balance Foundation had provided a number of recommendations following the verification of the 2008 report including:

- Further explanation of commitments and the evidence required to meet these.
- Implementation of data management protocols to reduce the potential for data entry error.
- Improvements to data management, particularly to the design of the database used to collate Signatories performance against the commitments to reduce potential for Signatory data error.

- Further support to Signatories to improve their understanding of the requirements of the Product Stewardship Program commitments.

To address these issues, a new data collection form was designed and used for the 2009 Survey. This document fully defined each commitment, defined the specific compliance requirement and detailed the evidence required to measure compliance.

Furthermore, to collate Signatory performance, a matrix was developed identifying Company performance for each commitment, showing Compliance/Partial Compliance/Non-Compliance/Not Applicable.

The Vinyl Council continued to offer support to Signatories to achieve compliance and to clarify the requirements, for example, on Open Disclosure or encouraging Consumer Responsible Care.

### 2009 verification

The verification process for this year's report involved four Signatory site visits to examine data sources and verify data/statements and four Signatory desktop data audits, verified by telephone. The methodology uses a specified set of principles and standards to assess the quality of a Signatory's reported data and the organisation's underlying systems, processes and competencies that underpin its performance.

Of the eight Signatories audited two had made errors reporting against the residual VCM Commitment, three against the EMS minimum standards, one against the Lead and Cadmium phase out, one with open disclosure and three with recycling.

A copy of Net Balance's independent Verification Statement follows overpage.

## FINAL INDEPENDENT VERIFICATION STATEMENT

To the Signatories and Stakeholders of the Vinyl Council of Australia:

The Vinyl Council of Australia (VCA) commissioned Net Balance Foundation (Net Balance) to provide independent verification of the information presented within the VCA Product Stewardship Program Progress Report 2009 (the 'PSP Report').

The PSP Report presents the performance of Product Stewardship Program Signatories against the commitments of the VCA Product Stewardship Program (PSP) over the period 1 January 2009 to 31 December 2009. VCA was responsible for the preparation of the PSP Report and the verification statement represents Net Balance's independent opinion on the reliability of information presented within it. Net Balance's responsibility as an independent verification provider is to VCA alone and in accordance with the agreed terms of reference. Other stakeholders should perform their own due diligence before taking any action as a result of this statement.

### *Verification objective*

The verification objective is to provide VCA and its stakeholders with an independent opinion on the accuracy of the information presented within the PSP Report. This is confirmed by verification of the claims made through a review of the underlying systems, processes, information and data used to support the performance disclosures presented.

### *Verification process and limitations*

The level of verification provided is defined by the methodology described in this verification statement. The verification covered the complete PSP Report and focused specifically on the systems and activities of a selection of eight Signatories during the reporting period, with the following limitations:

- Sampling methodology was used to select eight Signatories for verification to provide an appropriate representation of the Signatory group, which comprised 29 organisations in 2009. Similar to past years, it is expected that future verification programs will select a different group of Signatories and thus allow for breadth of coverage across the PSP over time.
- The scope of work was limited to verification of data and statement accuracy and did not extend to an AA1000 assurance process.

### *Verification methodology*

The verification process comprised two stages, and was undertaken between May and October 2010. This involved:

#### 1. Review of the Signatory data

Review of the accuracy and source of data and statements submitted by the Signatories to the PSP. This included the following tasks:

- The examination of 64 selected data points.
- Interviews with key Signatory personnel responsible for collating and submitting data to the PSP to verify the veracity of the submitted data. This took place by undertaking site visits and examining the relevant site-based data for four selected Signatories.
- Reviewing data from an additional four Signatories via desk-top assessment including telephone and e-mail dialogue.
- Completing a logic review for compatibility and consistency on the remaining data submitted by Signatories, which was not formally verified by Net Balance.

Signatories subjected to site-based review were:

- Pacific Plastics – 82-88 Meakin Road, Meadowbrook, Queensland, Australia.
- Pipemakers – 186 Ingram Road, Acacia Ridge, Queensland, Australia.
- Plaspak Peteron – 36-42 Hydrive Close, Dandenong South, Victoria, Australia.
- Welvic Australia – Gate 6 Tilburn Road, Deer Park, Victoria, Australia.

Signatories subjected to desktop review were:

- Aperio Group – 9-19 Rooks Road, Nunawading, Victoria, Australia.
- Australian Plastic Profiles – 12 Cawarra Road, Caringbah, New South Wales, Australia.
- Gerflor – 17 Cato Street, Hawthorn East, Victoria, Australia.
- Iplex Pipelines – 35 Alfred Road, Chipping Norton NSW 2170, Australia.

#### 2. Review of PSP Report

A review of the accuracy and source of aggregated data and statements contained within the PSP Report was undertaken. This included the following tasks:

- The aggregation of all data and statements submitted by Signatories to allow analysis of overall performance against the commitments of the VCA Product Stewardship Program.
- The examination of 39 selected aggregated data points and statements.
- Interviews with the key VCA personnel responsible for aggregating data and statements from the submitted Signatory data and preparing the PSP Report to verify the veracity of the reported data. This took place through a site visit and various e-mail and telephone dialogues.

### *Our independence*

Net Balance was not responsible for preparation of any part of the PSP Report. Net Balance has not undertaken any commissions for VCA in the reporting period. As such the verification team was deemed independent and objective.

### *Our competency*

The verification team was comprised of individuals with expertise in environmental performance measurement. The verification team has collectively undertaken over 120 verification or assurance engagements in Australia over the past 10 years and is led by a Lead Sustainability Assurance Practitioner (Lead CSAP) accredited by the Independent Register of Certified Auditors (IRCA UK).

### *Our opinion*

Based on the verification procedures undertaken, the following represents Net Balance's opinion:

On data submitted by Signatories:

- The Signatories' systems and processes to track performance against the commitments of the Product Stewardship Program were mixed, but generally provide confidence in the information reported. The quality of the system was often dependent on the size and resources of the organisation.
- A number of Signatories would benefit from further explanation of the evidence required to meet Commitment 1.3 *Minimum Standards for Environmental Management Systems*. Net Balance notes that VCA acknowledges this and plans to assist relevant Signatories in meeting the requirements of this commitment prior to the next reporting period.
- Data trails selected were in general identifiable and traceable, and the personnel responsible were able to demonstrate the origin(s) and interpretation of data.
- The level of accuracy for the information submitted by the Signatories to the VCA Product Stewardship database was found to be within acceptable limits. Waste management data was often estimated and improvements to data measurement and record keeping systems would improve the accuracy of this information for a number of Signatories.

On the report:

- The findings of the PSP Report verification provide confidence in the reporting processes established.
- Data trails selected were easily identifiable and traceable, and the personnel responsible were able to reliably demonstrate the origin(s) and interpretation of data.
- The level of accuracy of the data and statements made were found to be within acceptable limits. In the longer term, VCA should move towards a more automated process of data collection and consolidation. This will avoid the potential for transcription errors particularly when aggregating Signatory data.
- The statements made in the Report appropriately reflect the environmental performance achieved during the period.
- All suggested changes were satisfactorily addressed by VCA prior to finalising the Report.

Overall, it is Net Balance's opinion that the information presented within the Report is fair and accurate and that the Report is a reliable account of the Signatories' and the VCA's performance against the PSP commitments during the reporting period.

### *The way forward*

The VCA has developed a sound process for collecting and reporting Signatory performance against the commitments of the PSP. This public and transparent reporting against commitments is helping to raise the standard of environmental performance in the vinyl industry in Australia.

To continue to drive improvements in environmental performance and reporting amongst its Signatories, it is recommended that the VCA continues to:

- Engage with Signatories regarding the format of the data submission document and how to make the process of submitting data easier.
- Work with Signatories to improve their understanding of the requirements of the PSP commitments, especially new Signatories and those with limited resources.
- Assist relevant Signatories to meet Commitment 1.3 *Minimum Standards for Environmental Management Systems* prior to the next reporting period.
- Assist Signatories to develop their data capture systems, particularly in relation to waste management.
- Assist Signatories to further develop consumer responsible care information for customers regarding safe waste management, disposal and recycling options for relevant products at end-of-life.
- Develop strong and measurable new commitments as current commitments are achieved. New commitments should reflect material issues within the industry, drive best practice and enable accurate progress reporting.

These have been outlined in a more detailed report presented to the VCA.

On behalf of the verification team  
6 October 2010  
Melbourne, Australia



Terence Jeyaretnam  
Director, Net Balance, FIEAust & Lead CSAP (IRCA UK)

Appendix 1: Signatory Relevance Matrix			Manufacturing & Storage			Heavy Metal Additives						Plasticisers			Waste Management				Research	Public Reporting					
Product Stewardship Program Signatory	Category	Product/Sector	Residual VCM	VCM Emissions	EMS Minimum Standard	Lead and Cadmium Code of Practice	Lead Stabiliser Phase out	Cadmium Stabiliser Phase out	Pigment Phase out	Monitor O/S Developments in Additives	Open Disclosure	Phthalate Policy Adherence	Share phthalates info	Plasticiser Use	National Packaging Covenant	Recycling	Encouraging Consumer Responsible Care	Life Cycle Thinking	Monitor OS Recycling	Research	Performance against Commitments	PVC life cycle impacts	Product Stewardship Program Review		
Australian Vinyls Corporation Pty Ltd	Resins Mfr/supplier	Resin	●●●	●●●	●●●	N/A	N/A	N/A	N/A	N/A	●●●	●●●	●	●●●	●●●	●	●●●	N/A	N/A	N/A					
Aperio Group (Australia) Pty Ltd	Converter	Packaging	●●●	N/A	●●●	N/A	N/A	N/A	N/A	N/A	●●●	●●●	N/A	●●●	●●●	●●	●●●	●	N/A	N/A					
Armstrong World Industries (Australia) Pty L	Converter	Flooring	●●●	N/A	●●●	N/A	N/A	N/A	N/A	N/A	●●●	●●●	N/A	●●●	N/A	●●	●●●	●●●	N/A	N/A					
Australian Plastic Profiles Pty Ltd	Converter	Rigid Profiles/Pipe	●●●	N/A	●●●	●●●	●●●	N/A	●●●	N/A	●●●	N/A	N/A	N/A	N/A	●●	●●●	N/A	N/A	N/A					
Australian Resilient Flooring Assoc'n	Assoc		N/A	N/A	N/A	N/A	N/A	N/A	N/A	●	N/A	N/A	N/A	N/A	N/A	●●●	N/A	N/A	●	N/A					
Gerfloor Australasia Pty Ltd	Importer	Flooring	●●●	N/A	●●●	N/A	N/A	N/A	N/A	N/A	●●●	●●●	N/A	●●●	N/A	●●	●●●	●●●	N/A	N/A					
Kenbrock Flooring (Aust) Pty Ltd	Importer	Flooring	●●●	N/A	●●●	N/A	N/A	N/A	N/A	N/A	●●●	●●●	N/A	●●●	N/A	●●	●●●	N/A	N/A	N/A					
Pegulan Floorcovering Pty Ltd	Importer	Flooring	●●●	N/A	●●●	N/A	N/A	N/A	N/A	N/A	●●●	●●●	N/A	●●●	N/A	●●	●●●	●●●	N/A	N/A					
Signature Floorcoverings Pty Ltd	Importer	Flooring	●●●	N/A	●●●	N/A	N/A	N/A	N/A	N/A	●●●	●●●	N/A	●●●	N/A	●●	●●●	●●●	N/A	N/A					
Forbo Floorcoverings Pty Ltd	Importer	Flooring	●●●	N/A	●●●	N/A	N/A	N/A	N/A	N/A	●●●	●●●	N/A	●●●	N/A	●●	●●●	●●●	N/A	N/A					
Chemson Pacific Pty Ltd	Supplier	Stabilisers	N/A	N/A	●●●	●●●	●●●	N/A	N/A	N/A	●●●	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
Dincel Construction System P/L	Converter	Rigid Profiles	●	N/A	●●●	N/A	N/A	N/A	N/A	N/A	●●●	N/A	N/A	N/A	N/A	●	●●●	N/A	N/A	N/A					
Iplex Pipelines Australia Pty Ltd	Converter	Rigid Pipes	●●●	N/A	●●●	●●●	●●●	N/A	●●●	N/A	●●●	N/A	N/A	N/A	N/A	●●	●●●	N/A	N/A	N/A					
Pacific Plastics (QLD)	Converter	Flexible	●●●	N/A	●●●	●●●	●●●	N/A	N/A	N/A	●●●	●●●	N/A	●●●	N/A	●	●●●	N/A	N/A	N/A					
PIPA	Assoc		N/A	N/A	N/A	●	N/A	N/A	N/A	●	N/A	N/A	N/A	N/A	N/A	●●	N/A	N/A	●	N/A					
Pipemakers	Converter	Rigid Pipes	●	N/A	●●●	●●●	●●●	N/A	N/A	N/A	●●●	N/A	N/A	N/A	N/A	●●	●●●	N/A	N/A	N/A					
Plaspak Peteron Pty Ltd	Converter	Packaging	●●●	N/A	●●●	N/A	N/A	N/A	N/A	N/A	●●●	N/A	N/A	N/A	●●●	●●●	●●●	●●●	N/A	N/A					
Plastral Pty Ltd	Supplier	Additives	●	N/A	●●●	N/A	N/A	N/A	N/A	N/A	●●●	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
Pliant Corporation Pty Ltd	Converter	Packaging	●●●	N/A	●●●	N/A	N/A	N/A	N/A	N/A	●●●	●●●	N/A	●●●	●●●	●●	●●●	N/A	N/A	N/A					
Polyflor Australia Pty Ltd	Importer	Flooring	●●●	N/A	●●●	N/A	N/A	N/A	N/A	N/A	●●●	●●●	N/A	●●●	N/A	●●	●●●	N/A	N/A	N/A					
Sun Ace Australia Pty Ltd	Supplier	Stabilisers	N/A	N/A	●●●	●●●	●●●	N/A	N/A	N/A	●●●	N/A	N/A	N/A	N/A	N/A	●●●	N/A	N/A	N/A					
Tarkett Australia Pty Ltd	Importer	Flooring	●●●	N/A	●●●	N/A	N/A	N/A	N/A	N/A	●●●	●●●	N/A	●●●	N/A	●●	●●●	●●●	N/A	N/A					
Tech Plas Extrusions Pty Ltd	Converter	Rigid Profiles	●●●	N/A	●●●	●●●	●●●	N/A	●●●	N/A	●●●	N/A	N/A	N/A	N/A	●	●●●	●●●	N/A	N/A					
Terminals Pty Ltd	Storage	Storage	N/A	N/A	●●●	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
Tyco Water Pty Ltd	Converter	Rigid Pipes	●●●	N/A	●●●	N/A	N/A	N/A	N/A	N/A	●●●	N/A	N/A	N/A	N/A	●●	●●●	N/A	N/A	N/A					
Ubique	Resin Supplier	Resin, Phthalates	●●●	N/A	●●●	N/A	N/A	N/A	N/A	N/A	●●●	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A					
Vinindex	Converter	Rigid Pipes	●●●	N/A	●●●	●●●	●●●	N/A	●●●	N/A	●●●	N/A	N/A	N/A	N/A	●●	●●●	N/A	N/A	N/A					
Vinyl Council of Australia	Assoc		N/A	N/A	N/A	N/A	N/A	N/A	N/A	●●●	N/A	N/A	●●●	N/A	N/A	●●●	N/A	N/A	●●●	●●●	●●●	●●●	●●●		
Welvic Australia	Compounder	Compounder	●●●	N/A	●●●	●●●	●●●	N/A	●●●	N/A	●●●	●●●	N/A	●●●	N/A	●	N/A	N/A	N/A	N/A					
			●●●	Highly relevant				●●	Moderately relevant			●	Low relevance												

## Appendix 2: Vinyl-2-Life Action Plan - Report of Activities 2009

Cable scrap	Actions	Progress
Increase PVC cable scrap recovery in Australia and diversion from landfill.	Work with AMRIA to educate metal recyclers on plastics cable scrap recovery and reprocessing opportunities in Australia.	<p>Actively promoted the opportunity to reprocess cable scrap domestically to the Australian Metal Recyclers Industry Association through flyers and a presentation to its members.</p> <p>Explored opportunity with government to measure cable scrap disposal to landfill.</p> <p>Obtained limited data/information from Hyder research commissioned.</p> <p>Discussed opportunities to improve recovery with external stakeholders.</p>
Pipes & Profiles	Action	Progress
Develop a more consistent supply of pipe & profile material for reuse/recycling	<p>Maintenance of Recovery Program in Sydney, Melbourne, Brisbane.</p> <p>Identify additional sources of waste which can be reprocessed by pipe makers including window off-cuts waste</p>	<p>Collections and reprocessing continue. In 2009, a total of 323 tonnes pipe waste recovered and recycled.</p> <p>Engaged with recyclers and window fabricators.</p>
Floor Coverings	Action	Progress
Develop and implement a voluntary scheme(s) or initiative(s) aimed at encouraging higher recovery and recycling rates for vinyl floor covering waste.	<p>Work with ARFA on development of industry-wide offcuts recovery program</p> <p>Continue to support signatories in research and development of End of Life recovery and recycling</p> <p>Establish appropriate data measures and monitoring</p>	<p>ARFA joined the VCA providing opportunity to engage with broader section of flooring industry. Raised discussions with Signatories regarding development of industry-wide vinyl flooring offcuts recovery program.</p> <p>Provided recycling contacts and information to Signatories to facilitate recovery and establishment of trial projects.</p> <p>Explored opportunity with government to measure flooring waste disposal to landfill. Limited data on vinyl floor waste available.</p>
Bottles	Action	Progress
Support the Vinyl Bottle Group in continually enhancing recovery and local recycling of PVC bottles	Actively engage with the Vinyl Bottle Group to support their activities.	<p>Regular steering group meetings held.</p> <p>Program contributed to funding optical sorting equipment at a MRF to encourage sorting of PVC. Supply agreement with the MRF signed.</p>

Continued./

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Bottles continued./

Difficulties sourcing material from MRF's. 95 tonnes of bottles + 29 tonnes of blisterpack material recovered and recycled in 12 months to 30.6.09. Disseminated educational/promotional materials on recyclability of PVC bottles.

<b>Medical</b>	<b>Action</b>	<b>Progress</b>
Encourage the recovery and recycling of medical waste	Maintain trial to recover and recycle PVC medical waste, diverting it from landfill.	Medical general plastic waste trial underway in conjunction with Western Hospital, Melbourne and PVC reprocessor.
	Engage with stakeholders to address barriers identified in the medical waste trial	Trial extended to second hospital in the Western Hospital Group. 56 collection bins in use, supported by grant received by hospital for the project.
	Assess feasibility to extend trial to other hospitals.	Worked with staff to educate on reducing contamination by other materials/products.  Held discussions with stakeholders to explore up-scaling the project.
<b>Management</b>	<b>Action</b>	<b>Progress</b>
Develop mechanisms for improved data collection and reporting of PVC recycling	Investigate data collection with Hyder Consulting	Hyder Report finalised in May 2009 and reviewed. Findings shared with Technical Steering Group. Further work needed to generate data on which measures can be based.
<b>Other Recycling</b>	<b>Action</b>	<b>Progress</b>
Increase awareness of PVC recycling and recyclability	Promote, encourage and support PVC recycling activities	Provision of information on PVC recycling and locations of PVC recyclers via website. Medical waste recycling publicised in Health journals. Promoted recyclability of PVC at RMIT Green Building & design conference.
	Address barriers to increased recycling of PVC	Identify and engage with relevant stakeholders

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