VinylPlus contribution in response to UNEP invitation to submit available information in relation to paragraph 4 of UNEP Governing Council Decision 27/12 Section II. Lead and Cadmium

The European PVC industry's experience in replacing lead and cadmium-based stabilisers

Brussels, 30 May 2014

1. Introduction

VinylPlus[1] welcomes the opportunity to contribute with the experience and information of the European PVC industry to follow-up to UNEP Decision 27/12: Chemicals and waste management; Section II on Lead and Cadmium.

VinylPlus is the renewed ten-year Voluntary Commitment to sustainable development by the European PVC industry. The VinylPlus programme was developed through open dialogue with stakeholders, including industry, NGOs, regulators, civil society representatives and PVC users. The regional scope of the programme is the EU-27 plus Norway and Switzerland.

VinylPlus is built around five commitments aimed at: achieving higher recycling rates of PVC and developing innovative recycling technologies; addressing any potential concerns about organochlorine emissions; ensuring the sustainable use of additives; improving energy efficiency and the use of renewable sources and raw materials in PVC production; and promoting sustainability awareness throughout the whole PVC value chain.

In relation to the sustainable use of additives, VinylPlus is committed to replacing lead-based stabilisers across the EU-27 by the end of 2015. The substitution of lead-based stabilisers in Europe started under the previous voluntary programme, Vinyl 2010, which saw the industry successfully reaching the 50% lead stabilisers reduction in the EU-15 two years ahead of the 2010 target.

In the framework of Vinyl 2010, the phase-out of cadmium stabilisers was completed in the EU-15 by 2001 and in the EU-27 by the end of 2007.

VinylPlus is pleased to contribute to UNEP's compilation of information on the possibility of replacing lead and cadmium, sharing its experience characterized by:

- Value chain approach
- Research and innovation
- Corporate and financial commitment
- SMEs inclusion in the process
- Sharing experience and best practices with the other regional PVC industry associations at global level.

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[1] VinylPlus is the legal entity set up to provide the organisational and financial infrastructure needed to manage and monitor the progress towards the goal set in the Voluntary Commitment of the European PVC industry. It groups European vinyl resin manufacturers and plastic converters, as well as producers of stabilisers and plasticisers. The four founding members are: the European Council of Vinyl Manufacturers (ECVM – www.pvc.org), the European Plastics Converters (EuPC – www.plasticsconverters.eu), the European Stabiliser Producers Associations (ESPA – www.stabilisers.eu) and the European Council for Plasticisers and Intermediates (ECPI – www.plasticisers.org).

VinylPlus closely involves external stakeholders and policy-makers through an independent Monitoring Committee, which supervises the implementation of the Voluntary Commitment, ensuring guidance, transparency and accountability.

Progress towards the set targets are audited and verified by independent third parties and published in the annual report (www.vinylplus.eu).

2. Background

Polyvinyl chloride, or 'PVC', is one of the most widely used polymers in the world. Due to its very versatile nature, PVC is used extensively in many industries and provides several popular and necessary products in construction and infrastructure, transportation, electric and IT cabling, smart & credit cards, packaging, fashion & design, medical devices, amongst other things.

Stabilisers are added to PVC to allow its processing and to improve its resistance to external factors such as heat and sunlight (ultraviolet rays).

2.1. Cadmium-based stabilisers

Cadmium-based stabiliser systems have been used for many years due to their excellent performance qualities. However, in the European Union area, their use was phased out voluntarily as part of the PVC industry's Voluntary Commitment of 2000 (Vinyl 2010) due to concerns about toxicity and possible accumulation in the body.

Cadmium was used in the form of a stearate or laurate for stabilising PVC and was almost invariably combined with a similar barium ester.

Barium/cadmium stabilisers did impart excellent heat stability and outstanding weatherability to PVC products. They were used in semi-rigid and flexible foil for products such as roofing membranes and in rigid applications for outdoor use such as window profiles. In Europe, they have been replaced by barium/zinc stabilizers in foils.

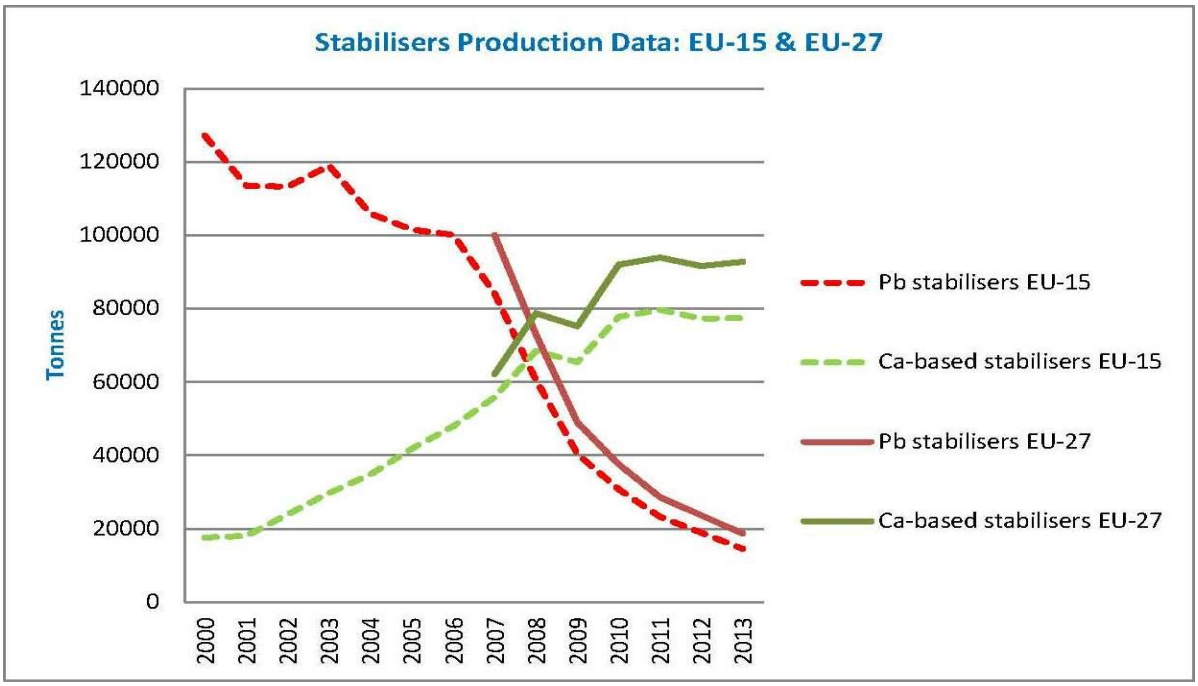
Although cadmium is widely spread in nature and is present in low concentrations in soil, water and air, there have been major concerns about the effect that higher concentrations of cadmium dust have on human health and on the environment. No stabiliser containing cadmium has ever been used for food contact applications or toys. The EU Directive 91/338 still allowed the use of cadmium stabilisers in window profiles and roofing membranes but the Voluntary Commitment of the PVC Industry signed in 2000 resulted in discontinuation of use of cadmium stabilisers by all its members as from 2001 in the EU-15 and from 2007 in the EU-27.

2.2. Lead-based stabilisers

Lead has the longest history as a stabiliser for PVC. Lead compounds are very cost-effective and their stabilising results are excellent, particularly for PVC products with long service life and required to endure longer fabrication (heating) time.

After concerns have been expressed about possible adverse effects of lead on health and the environment, in 2004 independent experts completed a full Risk Assessment on lead and the results have been passed on to the European Union authorities. Under the terms of the PVC Industry Voluntary Commitments, sales of lead-based stabilisers will be replaced by the end of 2015 across the EU-27. In 2014, the commitment will be extended to the EU-28.

Lead-based stabilisers are being progressively replaced by calcium-based stabilisers, which are used as an alternative.



In the 2007-2013 period, use of lead stabilisers decreased by 81,372 tonnes (-81.4%) in the EU-27, while use of calcium-based stabilisers increased by 30,643 tonnes in the EU-27 plus Norway, Switzerland and Turkey.

2.3. Legacy additives

Legacy additives are substances whose use in PVC products has been discontinued but that are contained in recycled PVC. Excessive restrictions on the use of recyclates containing legacy additives might undermine the development of recycling schemes. VinylPlus is therefore cooperating with the relevant European authorities and developing studies with independent bodies to assess and address this issue.

In March 2012, VinylPlus and the Dutch consultant Tauw [2] initiated a study on the socio-economic impact of recycling waste streams containing lead. The study assessed the impact of possible regulations limiting lead content in PVC articles for building and construction over the time span 2015-2050. The study concluded that a lead limit of < 0.1% (w/w as Pb) in PVC articles, without exception for recycling, would have significant negative impacts both economically (loss of jobs, fewer companies, loss of added value for the EU economy) and for the environment (less recycling, more CO_2 emissions, greater use of resources). An exemption for recyclates use up to 1% lead limit in building products would be the best option if restrictions are to be applied. This would allow the continuation of recycling development, job creation, reductions in CO_2 emissions and the conservation of natural resources.

[2] Tauw: independent European consulting and engineering company (www.tauw.com)

In 2013, a modelling study on lead migration into water from sewage pipes containing recyclates conducted by the German institute Fabes[3] was completed. The study demonstrated very low levels of migration, well within Environmental Quality Standards for surface water.

3. VinylPlus' experience in replacing lead and cadmium-based stabilisers

The experience of the European PVC industry demonstrates that replacing lead and cadmium is a demanding process, particularly when these substances have been widely used for a long time, with excellent technical performance and cost-effectiveness, as this was the case for lead and cadmium-based PVC stabilisers.

It requires determination, strong corporate and financial commitment, research and innovation, and close cooperation within the value chain.

ESPA[4] member companies invested heavily in research to be able to develop suitable alternatives to the cadmium and lead-based systems. Close cooperation with their customers was fundamental to formulate the right stabilisers for the different products and processes, but also to support converters in their technical shift.

Lead stabilisers replacement required heavy financial and technical investments also from the converting industry side: a TEPPFA[5] inquiry in 2009 showed that the plastic pipes industry was still incurring €50 million extra annual costs associated with the replacement of lead stabilisers, mainly due to lower production output and higher scraps volumes. Similarly, the PVC window profile industry was still incurring 4% extra annual cost, as showed by an EPPA[6] inquiry.

The role of the industry associations was also very important, particularly for Small and Medium Sized Enterprises, in encouraging lead and cadmium replacement, sharing information and supporting their members in finding solutions to the technical issues.

Having put in place commercially viable alternatives to cadmium and lead-based compounds, the European PVC industry has been taken as example by other associations in the world such as the Australian Vinyl Council and SAVA (the Southern African Vinyls Association), that are addressing the issue of cadmium and lead-based stabilisers in their Product Stewardship Programmes.

In China, the Beijing-based China Plastics Piping Association (CPPA) recently[7] announced the adoption of a policy to encourage companies to eliminate lead by 2015, mirroring the European PVC industry's Voluntary Commitment.

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[3] www.fabes-online.de
[4] ESPA: the European Stabiliser Producers Associations (www.stabilisers.eu)
[5] TEPPFA: European Plastic Pipes and Fittings Association, an EuPC sectoral association (www.teppfa.org)
[6] EPPA: European PVC Window Profile and Related Building Products Association, an EuPC sectoral association (www.eppa-profiles.org)
[7] The announcement was made in September 2013, at the 2013 International Plastic Pipe Exchange Conference held in Xi'an, China