



## Performance Summary Report – Environmental Performance Agreement Respecting the Use of Tin Stabilizers in the Vinyl Industry (2008–2013)

### Purpose

This report summarizes the results achieved under the five-year [Environmental Performance Agreement Respecting the Use of Tin Stabilizers in the Vinyl Industry](#) (the Agreement; [PDF; 210 KB](#)) that was signed in March 2008 and expired in March 2013. It discusses how well the Agreement has worked, whether it met its objectives, and covers the lessons learned.

### Introduction

Organotins are a group of 109 substances on the Domestic Substances List (DSL) and 9 others under the New Substances and/or Transitional Substances provisions of the [Canadian Environmental Protection Act, 1999](#) (CEPA 1999). Tin stabilizers, or mono- and di-alkyltins (monomethyltins, monobutyltins, mono-octyltins, dimethyltins, dibutyltins, dioctyltins), are a class of chemical substances in the family of organotins having one and two alkyl groups respectively that are attached to the tin atom. There are approximately 94 tin stabilizers on the DSL.

Tin stabilizers are used mainly in the processing of polyvinyl chloride (PVC). Tin stabilizers are an effective type of heat stabilizer used to prevent degradation of the PVC from heat during processing.

As of 2004, the Vinyl Council of Canada (VCC), the Tin Stabilizers Association (TSA) and industrial users of tin stabilizers introduced a voluntary [Guideline for the Environmental Management of Tin Stabilizers in Canada](#) (the Guideline; [PDF; 90 KB](#)) to prevent the release of tin stabilizers to the environment by ensuring that these substances and their packaging materials are handled, stored, used and disposed of in a responsible manner. On November 18, 2005, Environment Canada (EC) proposed developing an Environmental Performance Agreement with the VCC and the TSA to confirm full implementation of the Guideline in all facilities using tin stabilizers. EC worked with industry between 2006 and 2008 to establish a five-year agreement, which was signed on March 10, 2008, by representatives from EC, the VCC, the TSA and vinyl compounding facilities. On August 8, 2009, EC published the final [Follow-up to the 1993 Ecological Risk Assessment of Organotin Substances on Canada's Domestic Substances List](#) ([PDF; 267 KB](#)), which concluded that tin stabilizers do not meet the criteria set out in section 64 of CEPA 1999 due mainly to voluntary industry-wide stewardship practices in place to limit their environmental release. In light of this conclusion and of the industry-wide efforts, these substances have not been recommended to be added to Schedule 1, the List of Toxic Substances, of CEPA 1999.

The purpose of the Agreement was to prevent the release of tin stabilizers into the environment, in quantity or concentration above an acceptable level, through the full implementation of the industry Guideline by all vinyl compounding facilities using tin stabilizers in Canada. As per the Agreement, a verification program was developed to ensure that all signatories to the Agreement followed the Guideline. [Annual progress reports](#) were published on EC's website to inform the public of the results of the verifications conducted jointly by EC and the VCC.

## **Signatories to the Agreement**

Originally, there were 34 facilities signatory to the Agreement, but due to new facilities that opened and to some facility closures or withdrawal of product lines, this number varied slightly throughout the duration of the Agreement. By the end of the five-year period, 33 facilities were using tin stabilizers, and all of them had fulfilled the requirements of the Agreement. The following is a list of the companies and the location of their facilities:

- Clariant (Toronto, Ontario)
- Duchesne et Fils (Yamachiche, Quebec)
- Euramax Canada (Barrie, Ontario)
- Gentek Building Products Limited (Burlington, Ontario)
- IPEX Inc. (Edmonton, Alberta; Langley, British Columbia; Clarkson, London, Scarborough, Ontario; Saint Laurent, Saint-Joseph-de-Beauce, St. Jacques de Montcalm, Quebec)
- Kaytec Vinyl Inc. (Carstairs, Alberta; Cowansville, Quebec)
- KP Building Products (Acton, Ontario)
- Mitten Vinyl Inc. (Paris, Ontario)
- Morbern Inc. (Cornwall, Ontario)
- Next Polymers (Prescott, Ontario)
- Plastique Reinier (Marieville, Quebec)
- Plastmo Ltd (Brampton, Ontario)
- PurePlast (Cambridge, Ontario)
- Rehau Industries Inc. (Baie d'Urfé, Quebec; Winnipeg, Manitoba)
- Royal Flex Lox Pipe Limited (Abbotsford, British Columbia)
- Royal Pipe Systems (Woodbridge, Ontario)
- Royal Plastics (Concord, Ontario)
- Roytec Vinyl (Woodbridge, Ontario)
- Solucor (Bradford, Ontario)
- Soniplastics (Boucherville, Quebec)
- Vi-Lux Mouldings (Napanee, Ontario)
- Vision Extrusions (Woodbridge, Ontario)
- Westech Building Products (Calgary, Alberta)
- Window City Industries Inc. (Vaughan, Ontario)

## Requirements of the Agreement

The Agreement required that:

- The facilities present their annual reports to the VCC by completing the *Annual Report on Compliance with the Guideline for the Environmental Management of Tin Stabilizers in Canada*, using the Appendix G form of the Guideline, by June 30 of each year.
- The VCC provide EC with a consolidated Annual Conformance Report summarizing the status of compliance at all of the facilities by September 30 of each year.
- EC publish on its website a yearly [progress report](#) concerning the Agreement.
- The TSA complete and submit to EC an update of Annex B of the Guideline that pertains to the distribution mode of tin stabilizers sold in Canada.
- The VCC, the TSA and EC develop and administer a verification program, in order to ensure that participating facilities comply with the Guideline.

## Verification Program

As part of the verification program, a verification protocol was developed by EC, the VCC and the TSA. The protocol established roles for EC, the VCC, the TSA and participating facilities, and procedures for planning and conducting the verifications. The objective of the verification program was to confirm that the Guideline was being implemented by all participating facilities in order to prevent the release of tin stabilizers into the environment and to confirm that the commitment made by each facility under the Agreement was being met.

A team consisting of a representative from the VCC and an EC official undertook the verifications. The VCC's representative was the lead verifier. The EC official was also part of the verification team and followed up with the VCC representative on the status of the results of the verifications. The verification team:

- conducted facility verifications;
- participated in related preparatory activities;
- documented the results of verifications;
- provided recommendations on where the facility should focus its attention in the future; and
- identified potential corrective actions in order to address any areas where the verification team was of the opinion that the Guideline had not been implemented.

Each facility designated a representative to cooperate with the verifiers. The appropriate manager and staff involved in the activities being verified were also present at the time of the verification, including the facility staff member who completed the annual compliance form (Appendix G of the Guideline).

Before starting the verification program, one pilot verification was undertaken in December 2008 to test the process. On average, seven verifications were conducted each year.

**Pre-verification activities:**

Prior to the verification, a teleconference was held with the facility's staff to plan and organize the visit. The teleconference allowed the verification team and the facility representatives to discuss the documentation referred to in the Guideline that would be reviewed during the verification. The facility was also requested to provide, prior to the site visit, a document package related to its environmental management of tin stabilizers. This helped verifiers familiarize themselves with different aspects of the tin stabilizer infrastructure in the facility in order to optimize the verification process.

**Typical on-site verification activities:**

The verification team had an opportunity to interact with the operators and supervisors of the facility who deal with the storage, handling and use of the tin stabilizers during the compounding process, and the processing of waste materials or empty containers. The verification of a facility generally lasted four to five hours. A typical verification included, but was not limited to, the following activities:

- The first step was a meeting with senior staff at the facility to have a general discussion about the facility, its processes and how the verification would proceed. This meeting was also used as an opportunity to provide information on the background of the Guideline and on the overall approach for compliance with the Agreement. The relevant documentation that was previously provided by the facility was discussed and reviewed by the verifiers with the participants. During the meeting, certain items of the documentation were clarified and additional information was exchanged.
- The second step was a tour with facility staff of the storage, compounding and processing areas where tin stabilizers are handled or used. The verification team assessed and documented the facility's compliance with the Guideline by using a verification guidance form.
- After the tour, the verifiers met in private, reviewed collected information and discussed findings. They then provided a verbal presentation of their preliminary conclusions to the facility staff, who then had the opportunity to react and respond to these preliminary comments. Before concluding the verification visit, the verification team described the next steps.

**Post-verification activities:**

After the verification, the facility could submit additional information to complete the verifiers' site visit file. The lead verifier created a written interim report and shared it with the other verifier for approval. This interim verification report was then sent to the facility manager for review and comment.

During its review, the facility had the opportunity to request the correction of inaccuracies and the deletion of any proprietary information from the interim verification report. The facility also informed the verification team, with appropriate documentation, of corrective actions that had taken place since the site visit, so that these could be noted in the final verification report.

The lead verifier revised the verification report as appropriate and according to the facility's comments. The final verification report was then reviewed and approved by the

other member of the verification team. Once approved, the final report was submitted to the facility manager. When required, a facility that was not in compliance with one or more elements of the Guideline, as indicated in the final results of the report, had to prepare an action plan indicating the planned corrective measures and associated timelines to address the deficiencies. The action plan was then reviewed and approved by the verification team.

The facility needed to implement the action plan and confirm its completion in writing to the VCC within the timelines indicated in the action plan. The VCC sent to EC a copy of the supporting documentation demonstrating the completion of the corrective actions.

## Results

All facilities participating in the Agreement completed their annual compliance report on handling practices of organotin stabilizers using the Appendix G form for each reporting year. The reports from participating facilities were reviewed and consolidated by the VCC to produce an annual conformance report provided to EC for each reporting year.

The VCC completed and submitted to EC an update of Annex B of the Guideline, Report on Tin Stabilizer Sold in Canada for the year 2011.

Overall, the Guideline was implemented before the site verification by the majority of the facilities based on their best knowledge and understanding of the Guideline. All areas for improvement that were identified during the site verifications were addressed by all of the facilities. Six action plans have been developed, and all have been fully implemented.

Over the lifetime of the Agreement (from March 2008 to March 2013), each of the 33 participating facilities were subject to a site verification conducted by representatives from EC and the VCC. The site verifications confirmed that the 33 facilities using tin stabilizers have in place the procedures and practices recommended in the Guideline, and therefore have fully implemented the Guideline.

EC has published on its website a yearly progress report on the site verifications for [2009](#), [2010](#), [2011](#), [2012](#) and [2013](#).

Performance measurement of the Agreement shows success in meeting the objective of preventing the release of tin stabilizers. It also confirmed the risk assessment assumption that if preventive measures are in place, tin stabilizers are non-toxic.

## Lessons Learned

This section presents some key lessons learned in using an environmental performance agreement as an instrument to manage risk associated with the release of tin stabilizers.

- The Agreement favoured open communication and a trustful relationship between parties, and a better understanding of how the vinyl compounding facilities operate.
- Site verification visits were an opportunity for EC and the VCC to confirm that the required pollution prevention measures of the Guideline have been fully implemented in each facility. The verifications also helped some facilities to fine-tune the application of the Guideline.

- The interaction between the facility representatives and the verifiers helped to increase awareness of the requirements of the Guideline and helped to develop possible improvements in the approach to prevent release of the substance into the environment.
- The verification process was constructive and provided the verifiers with the opportunity to informally make suggestions of best practices on related activities that were not covered by the Guideline.
- The composition of the verification team, which included representatives from both the industry and EC, allowed and favoured knowledge sharing amongst verifiers with different backgrounds and perspectives.
- The need to have a management committee to oversee the progress of the Agreement was identified early during implementation. As a result, an EC-VCC Committee was created and met on a quarterly basis to track progress and discuss issues with respect to implementation.
- The Guideline was written in general terms to provide flexibility for facilities to apply measures as appropriate for their operations. Through experience, verifiers learned to be less prescriptive in their requests for improvements and more focused on expected outcomes.
- Some continuous improvement opportunities were noted by the verifiers and offered as suggestions for consideration by the facilities. Even if these improvements were beyond the Guideline requirements, most of them were put into practice by the facilities.
- Documentation provided to verifiers by the facilities before the site visits facilitated the verifications and decreased the overall time required for the site visits.

## Conclusion

The Agreement expired on March 9, 2013. During the time the Agreement was in effect, site verifications were conducted at each of the 33 facilities participating in the Agreement, all of which had fully implemented the Guideline by the end of the Agreement, thereby requiring no more follow-up activities.

*The Environmental Performance Agreement Respecting the Use of Tin Stabilizers in the Vinyl Industry* achieved its intended objectives and was a successful instrument in preventing the release of tin stabilizers to the environment.

The experience of industry and EC cooperation for the implementation of the Agreement will be a valuable tool in establishing similar initiatives with other industrial sectors in the future.

## Next Steps

EC and the VCC are currently developing a new agreement to ensure continued adherence to the Guideline by all vinyl compounding facilities using tin stabilizers in Canada. The lessons learned that are listed in this report are being considered as the new agreement is being developed.

An environmental monitoring program is being developed in parallel to the new agreement. The purpose of this initiative is to further evaluate the effectiveness of the

agreement as a control instrument to manage tin stabilizers in preventing their release. The combined activities of the environmental monitoring and the new agreement will be used to determine whether any further action may be needed to prevent the release of tin stabilizers in the environment.

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