

VECAP: CONTROLLING EMISSIONS PROTECTING THE ENVIRONMENT BY CONTINUOUS IMPROVEMENT

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Abstract

The use of chemicals continues to be essential to meet the social and economic needs and goals of modern society. In recent years it has also been shown that manmade chemicals can be manufactured widely in a cost-effective manner and with a high degree of safety. However, it is also recognized that a lot still remains to be done to ensure the environmentally sound management of chemicals.

The brominated flame retardant (BFR) industry recognises that the general low toxicity of its products may have resulted in a lack of attention being paid in the past to emissions to the environment. In the past there have been emissive uses for brominated chemicals also used as flame retardants but these have now generally been eliminated. The vast majority of current emissions of brominated flame retardants to the environment happens during their manufacture and the manufacturing processes of those materials (in particular, plastics and textiles) that depend on BFRs to meet high levels of fire safety.

The chemical management tool set up by the BFR industry, through Bromine Science and Environmental Forum (BSEF)/EBFRIP, is VECAP (Voluntary Emissions Control Action Programme for commercial brominated flame retardants). The Programme has been set up to first identify and then control and reduce industrial emissions of BFRs to the environment by fostering a culture of continuous improvement through partnership with the supply and customer chain. VECAP is based on recognised environmental management programmes such as ISO 14001 and EMAS but stripped down to basics so that it really focuses on the target chemical and can be implemented by Small and Medium enterprises (SMEs).

It is based on the development and application of best practices driven by the VECAP model and Codes of Practice and targets process emissions from the main downstream users of BFRs, namely plastic and textile companies.

The VECAP process is structured to support the principle of continuous improvement, with the following six steps moving in a cyclical manner:

1 : Commitment to the VECAP Code of Good Practice

The VECAP system starts with the user's commitment to the VECAP programme, signing on to the Industry's Code of Good Practice and implementing these principles into the procedures and work instructions of daily operations.



Figure 1. Example of Deca-BDE; VECAP’s Code of Good Practice

2 : Self Audit

In a self-audit, a company identifies the production flow sheet of production processes involving BFRs.

3 : Mass Balance approach

The company determines the needed data to complete and close the mass balance as accurately as possible (signaling the gap in amount of BFRs entering and leaving the production processes based on a worst case scenario).

4 : Baseline emission survey

The company uses the obtained mass balance results as a baseline to demonstrate the actual process emission performance and to determine future opportunities for emissions reduction.

5 : Emissions

An emission improvement plan is determined in accordance with the company’s own objectives and policies.

6 : Implementation and continuous improvement

Once the improvement plan is implemented, operational results are evaluated and potential for further emission reductions investigated, ensuring effective continuous improvement.

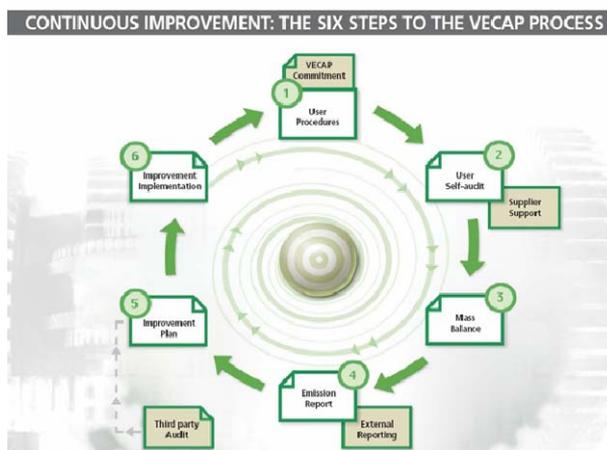


Figure 2. The VECAP process: continuous improvement

VECAP was first set up to cover the industrial uses of Deca-BDE, initially in the UK as a pilot project and later extended to other EU member states. Deca-BDE had been subject to an EU risk assessment, concluded in May 2004, which had identified no risk from its use in the EU and therefore had not recommended any restrictions. EBFRIIP decided nonetheless to establish VECAP for this product due to concerns about findings of Deca-BDE at low but increasing levels in the environment near industrial sites, which could lead to a risk sometime in the future because of Deca-BDE's long-standing stability and persistency (essential to maintaining its flame retardancy properties in the long-term).

A first VECAP annual progress report, presented in May 2006, reported on the implementation of the program for Deca-BDE (e.g. 75% reduction in Deca-BDE emissions to water by the UK textiles industry and significant progress in the other EU Member States, on target to cover 90% of Deca-BDE usage in the EU by June 2007).

On the basis of the initial progress of VECAP for Deca-BDE, industry has expanded the programme to other major commercial BFR applications (TBBPA and HBCD) and has launched the programme in USA, Canada and Japan. The next stage will be the introduction of an audit module which will enable the VECAP process at a user to be auditable by an independent third party. This will provide traceable compliance for major retailers or OEMs even if they are sourcing from outside the European Union or North America.

VECAP has succeeded in bringing downstream users, including SMEs together with suppliers of chemical substances and get them working together to minimize industrial emissions to the environment. It has highlighted the importance of communicating through the supply chain and the willingness of manufacturing industry to control emissions to the environment of specific chemicals on a voluntary basis, provided it is done in a straightforward and cost-effective manner. With REACH soon coming into effect this type of approach will become even more important.