EPA INFORMATION Bulletin

ENVIRONMENT PROTECTION AUTHORITY

Organotin Antifouling Paints

Publication 703 **June 2000**

1. Background

Organotins are used in a wide variety of industrial applications, usually in ways so that they are limited in their exposure to the environment (e.g. as stabilisers in PVC plastics). However, organotin compounds in the form of tributyltin (TBT) are active constituents of organotin antifouling paints[1]. In this form, they will cause harm to the environment if inappropriately used.

Antifouling paints are used to prevent the growth of 'fouling' organisms on marine structures and vessels. The paints are directed at 'target' organisms, which are essentially any marine organisms that settle on solid surfaces after a period of mobility in the sea.

The growth of fouling organisms on the hulls of vessels adversely affects the movement of vessels in water, resulting in increased fuel costs and transit time for the shipping industry. Fouling organisms can also interfere with the operation of submerged equipment and lead to the increased corrosion of marine structures.

Antifouling paints can be broadly distinguished as being of two forms – with or without TBT. There is a wide range of alternative TBT-free[2] paints in this latter category - these are not considered further in this Information Bulletin.

A consequence of the effectiveness of organotin antifoulants is their exceptional toxicity to 'non-target' marine organisms. Organotins interfere with biological processes in a diverse range of species. Worldwide scientific evidence in the 1980s demonstrated the extreme negative impacts of organotin compounds on the marine environment, with high concentrations of TBT found in marinas and correlated with growth abnormalities in mussels and oysters and a decline in their abundance[3]. Recent scientific studies have also found high elevations of organotin compounds in the tissues of marine mammals including dolphins. The presence of organotin has been linked to mass mortalities of marine mammals (seals, dolphins) through the weakening of their immune systems.

The harmful impacts from organotin antifouling paint have resulted in the Australian and New Zealand Environment Conservation Council (ANZECC) developing sediment quality guidelines[4] for TBT with a limit of 5 µg Sn/ kg dry wt sediment[5].

Organotin compounds are rapidly absorbed by fine marine sediments but are then re-released into the water.. This re-release creates a sustained environmental hazard.

[1] Organotin antifouling paint includes any coating, paint or treatment containing any compound of tin registered by or permitted for use by the National Registration Authority.

[2] Such TBT-free paints are highly suitable for small watercraft less than 25m.

[3] Organotin antifouling paint is a threatening process under the *Flora and Fauna Guarantee Act 1988.*

[4] Draft ANZECC Water Quality Guidelines for Marine and Fresh Waters 1998.

[5] 1 µg = 1 x 10^{-6} g. 1 µg Sn/ kg dry wt equals one part tin to 1000 million parts dry weight sediment. Sn is the chemical name for tin.

2. International controls on organotin antifouling paints.

Because of its highly toxic effect on the marine environment, TBT restrictions apply in many countries around the world. For example, countries of the European Union, Canada, Scandinavia and South Africa have banned the use of TBT on vessels less than 25 metres in length. Japan and New Zealand have banned the use of TBT antifouling paints on all vessels. This has resulted in highly restricted worldwide application of organotin antifoulant paints to vessels less than 25 metres in length.

Most Australian States and Territories have contributed to international efforts by banning the application of organotin antifouling paints to vessels less than 25 metres in length.

Although tightened controls on the application of organotin antifouling paints to small vessels have been positive in reducing the TBT load to the environment, organotin paints are still applied to large shipping vessels (e.g. tankers and container ships). The release of TBT from these vessels remains a significant environmental concern. Consequently, on 6 November 1998 the Marine Environment Protection Committee of the International Maritime Organisation approved a two-phased approach to the prohibition of organotin biocides in antifouling systems. The first phase will involve a global ban on the application of organotin compounds on marine vessels from 1 January 2003. The second phase involves a ban on the presence of biocidal organotin compounds on marine vessels and structures from 1 January 2008.

3. Victorian controls on organotin antifouling paints: 1989 – 1999.

In the 1980s, unacceptably high concentrations of TBT were recorded in Victorian waters. Since 1989, statutory controls were put in place to reduce organotin environmental loads, by restricting application of organotin antifouling paints to vessels 25 metres or greater in length, and requiring Environment Protection Authority (EPA) approval prior to application. These restrictions have generally resulted in improved environmental conditions, although scientific survey work[6] suggests that localised Victorian areas are subject to recent contamination (which may indicate illegal application).

On 1 June 1999, the *Environment Protection (Organotin Antifouling Paint) Regulations* 1989 sunsetted. The regulations have now been replaced with a Notifiable Chemical Order made under Section 30D of the *Environment Protection Act* 1970. The Notifiable Chemical Order effectively continues the long standing regulatory controls in Victoria, by restricting the sale, supply and application of organotin antifouling paints.

4. Notifiable Chemical Order for the control of the sale and application of organotin antifouling paints

The Notifiable Chemical Order:

1. declares organotin antifouling paint to be a Notifiable Chemical;
2. places controls on the sale and supply of organotin antifouling paint;
3. prohibits the handling, use, sale or supply of organotin antifouling paint in relation to:
   (i) any rope, net, pier, buoy, mooring, or any other structure in marine, freshwater, estuarine or State coastal waters whether fixed, non-fixed or temporary;
   (ii) any vessel that is less than 25 metres in length or any fixture, component or part of any vessel that is less than 25 metres in length[7].
4. requires the written consent of EPA for the application of the Notifiable Chemical to vessels 25 metres or greater in length or any fixture, component or part of a vessel 25 metres or greater in length.

This order applies to all persons and vessels in the State of Victoria. The specific requirements and practical advice for the legitimate sale and application of organotin antifouling paints are provided below.

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[6] Recent environmental survey data suggests that there are 'hotspots' in some marinas and boat harbours (i.e. higher than expected TBT levels). See EPA Publication No. 656 "Review of the Environment Protection (Organotin Antifouling Paint) Regulations 1989".

[7] 'length' means the overall length of the hull.

5. Requirements of the seller/ supplier

Sellers or suppliers are able to sell or supply organotin antifouling paints without the written approval of EPA. However, when selling or supplying organotin antifouling paints, sellers/ suppliers must:

1. sell/ supply only National Registration Authority (NRA) registered or permitted antifouling paints;
2. view and record documentation, on the Sales Documentation Form, that shows that the vessel to which the paint is to be applied is 25 metres or greater in length. (See Box 1: Documentation Required for the Purchase of Organotin Antifouling Paints);
3. complete the Sales Documentation Form[8], which records the identity of the purchaser and details of the vessel;
4. provide the buyer with a copy of the Sales Documentation Form and this EPA Information Bulletin, which explains the nature and limited uses of the Notifiable Chemical;
5. keep a record of the Sales Documentation Form for 5 years;
6. send a copy of the Sales Documentation Form to EPA Technical Support within 30 days of sale/ supply.

These steps are illustrated in the attached Flowchart.

6. Requirements of the buyer/ recipient

When purchasing/ receiving organotin paint, the buyer /recipient is required to:

1. assist in the completion of the Sales Documentation Form, which is a record of the identity of the purchaser/ recipient and vessel details;
2. provide acceptable documentation to show that the vessel to which antifouling paint is to be applied is 25 metres or greater in length (See Box 1: Documentation Required for the Purchase of Organotin Antifouling Paints);
3. show proof of identification (See Box 2: Identification Required by Purchaser);
4. receive a copy of the Sales Documentation Form, and this Information Bulletin - which implies an understanding of the conditions of application.

These steps are illustrated in the attached Flowchart.

In the event that the specified documentation required of the buyer/ recipient is not available (e.g. if the vessel is under construction and thus has no vessel registration papers), the buyer/ recipient should contact EPA Technical Support to gain the relevant approval prior to purchase.

Also, in some cases, intended users may wish to seek the approval of EPA to apply the paint prior to purchasing the paint – thus the user would know that he/ she can purchase the paint in good faith being able to apply it within Victoria.

7. Application and disposal of the notifiable chemical

The use of organotin antifouling paint that is not approved or permitted by the National Registration Authority is illegal.

Organotin antifouling paints may only be applied to vessels or parts of vessels that are 25 metres or greater in length with the written consent of EPA. The application of organotin antifouling paints is subject to any conditions imposed by EPA. EPA has the power to revoke or vary a condition as it considers appropriate. Written application requests, including the vessel's name and length, quantity of organotin antifouling paint to be used and site of application should be sent to EPA Technical Support at the address listed below.

As discussed in section 6, persons intending to apply organotin antifouling paint to vessels greater than 25 metres within Victoria may seek approval from EPA for the application of the paint before purchase.

The application, maintenance and removal of antifouling paints must be performed in accordance with current best practice or guidelines approved by EPA. There must be no contamination of the marine environment. Organotin compounds are prescribed wastes and must be disposed of and transported in accordance with *Environment Protection (Prescribed Waste) Regulations 1998.*

[8] This form is provided by EPA and is available from sellers/ suppliers.

BOX 1: DOCUMENTATION REQUIRED FOR THE PURCHASE OF ORGANOTIN ANTIFOULING PAINTS.

A copy of the following documentation must be shown when purchasing or receiving organotin antifouling paints:

1. For commercial vessels operating solely in the coastal waters of Victoria or Australian territorial seas – Certificate of Survey (or equivalent) as issued by the Marine Board of Victoria or other relevant State or Territory.
2. For internationally flagged vessels or vessels undertaking overseas voyages – the ship's Lloyd's Register (LR) Number and an imprint of the Ship's Stamp.
3. For recreational (non-commercial) vessels – vessel registration papers.
4. For vessels not defined by any of the above categories – the written approval of EPA.

BOX 2: IDENTIFICATION REQUIRED BY PURCHASER.

The following forms of identification must be shown by the buyer when purchasing organotin antifouling paints:

1. For commercial vessels – a sales purchase order.
2. For recreational (non-commercial) vessels – a current driver's licence or current passport.

8. Failure to comply

Application of organotin antifouling paint without approval or its sale/ supply contrary to the Notifiable Chemical Order is an offence under section 30D of the *Environment Protection Act 1970*. Significant penalties apply. Under Section 66B of the *Environment Protection Act 1970*, persons concerned in the management of corporations and directors of corporations may also be found guilty of an offence.

Further information

For any enquiries regarding the sale, application or use of organotin antifouling paint please contact EPA Technical Support:

GPO Box 4395QQ
Melbourne VIC 3001
Telephone: 03 9695 2722
Fax: 03 9695 2780

EPA internet site
www.epa.vic.gov.au

Flowchart: Sale, supply and application of organotin antifouling paint