ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ
ပို့ဆောင်ရေးနှင့်ဆက်သွယ်ရေးဝန်ကြီးဌာန
ရေကြောင်းပို့ဆောင်ရေးညွှန်ကြားမှုဦးစီးဌာန
ညွှန်ကြားချက်အမှတ် ၁ / ၂၀၂၃

၁၃၈၅ ခုနှစ်၊ ဒုတိယဝါဆိုလဆန်း ၃ ရက်

(၂၀၂၃ ခုနှစ်၊ ဇူလိုင်လ ၂၀ ရက်)

ပို့ဆောင်ရေးနှင့်ဆက်သွယ်ရေးဝန်ကြီးဌာန၊ ရေကြောင်းပို့ဆောင်ရေးညွှန်ကြားမှုဦးစီးဌာန သည် မြန်မာနိုင်ငံကုန်သည်သဘော်အက်ဥပဒေ ပုဒ်မ ၂၉၄-ခ၊ ပုဒ်မခွဲ (ခ) အရ အပ်နှင်းထားသော လုပ်ပိုင်ခွင့်ကိုကျင့်သုံး၍ **"ဘေးအန္တရာယ်ရှိသင်္ဘောသုတ်ဆေးစနစ်များအား ထိန်းချုပ်ခြင်းဆိုင်ရာ ညွှန်ကြားချက်"** ကို ထုတ်ပြန်လိုက်သည်။

၁။ (က) ဤညွှန်ကြားချက်သည် အောက်ဖော်ပြပါသင်္ဘောများနှင့် သက်ဆိုင်စေရမည်-

(၁) မည်သည့်နေရာဒေသတွင်မဆို ရှိနေသော မြန်မာသင်္ဘောများ၊

(၂) မြန်မာအလံလွှင့်ထူမထားသော်လည်း နိုင်ငံတော်၏ အခွင့်အာဏာဖြင့် လုပ်ငန်းဆောင်ရွက်လျက်ရှိသည့်သင်္ဘောများ၊

(၃) မြန်မာနိုင်ငံ ဆိပ်ကမ်း၊ သင်္ဘောကျင်း၊ ကမ်းလွန်ဆိပ်ကမ်း သို့မဟုတ် မြန်မာ့ရေပြင်အတွင်းရှိသင်္ဘောများ။

(ခ) ဤညွှန်ကြားချက်သည် စစ်သင်္ဘောများနှင့် တပ်မတော် (ရေ) အထောက်အကူပြု သင်္ဘောများ၊ စီးပွားရေးနှင့်ကူးသန်းရောင်းဝယ်ရေးအတွက် ရည်ရွယ်ပြေးဆွဲခြင်း မဟုတ်ဘဲ လက်ရှိအချိန်တွင် အစိုးရကိစ္စအတွက်သာအသုံးပြုသည့် အစိုးရက ပိုင်ဆိုင်သော သို့မဟုတ် လုပ်ကိုင်ဆောင်ရွက်သောသင်္ဘောများနှင့် သက်ဆိုင်ခြင်း မရှိစေရ။ သို့ရာတွင် အဆိုပါသင်္ဘောများ၏ လုပ်ငန်းဆောင်ရွက်မှုများကိုဖြစ်စေ၊ လုပ်ကိုင်နိုင်စွမ်းကိုဖြစ်စေ ထိခိုက်မှုမရှိစေဘဲ တတ်နိုင်သမျှကျိုးကြောင်း ဆီလျော်စွာသင့်လျော်သောနည်းလမ်းများချမှတ်၍ ၂၀၁၁ ခုနှစ်၊ ဘေးအန္တရာယ်ရှိသင်္ဘောသုတ်ဆေးစနစ်များအား ထိန်းချုပ်ခြင်းနှင့်သက်ဆိုင်သည့် အပြည်ပြည်ဆိုင်ရာကွန်ဗင်းရှင်းပါ ပြဋ္ဌာန်းချက်များနှင့်အညီ ဆောင်ရွက်ရမည်။

၂။ အပိုဒ် ၁ (က) အရ သက်ဆိုင်သည့် သင်္ဘောများ၏ပိုင်ရှင်များ၊ ရေယာဉ်မှူးများ၊ သင်္ဘောလုပ်ငန်းဆောင်ရွက်သူများ၊ မန်နေဂျာများ၊ တိုင်းတာစစ်ဆေးရေးမှူးများ၊ အသိအမှတ်ပြုအဖွဲ့အစည်းများ (Recognized Organizations)နှင့် နိုင်ငံခြားသင်္ဘောစစ်ဆေးရေးမှူး

များသည် ဘေးအန္တရာယ်ရှိ သဘော်သုတ်ဆေးစနစ်များအား ထိန်းချုပ်ခြင်းနှင့်စပ်လျဉ်း၍ နောက်ဆက်တွဲ (က) တွင် ဖော်ပြထားသော ၂၀၀၁ ခုနှစ်၊ ဘေးအန္တရာယ်ရှိသဘော်သုတ်ဆေးစနစ်များအား ထိန်းချုပ်ခြင်းနှင့် သက်ဆိုင်သည့်အပြည်ပြည်ဆိုင်ရာကွန်ဗင်းရှင်း၊ နောက်ဆက်တွဲ (ခ) တွင် ဖော်ပြထားသော ဆုံးဖြတ်ချက် အမ်အီးပီစီ ၃၃၁(၇၆)၊ နောက်ဆက်တွဲ (ဂ) တွင် ဖော်ပြထားသော ဆုံးဖြတ်ချက် အမ်အီးပီစီ ၃၅၆(၇၈)၊ နောက်ဆက်တွဲ (ဃ) တွင် ဖော်ပြထားသော ဆုံးဖြတ်ချက် အမ်အီးပီစီ ၃၅၇(၇၈) နှင့် နောက်ဆက်တွဲ(င) တွင် ဖော်ပြထားသော ဆုံးဖြတ်ချက် အမ်အီးပီစီ ၃၅၈(၇၈) တို့ပါ ပြဋ္ဌာန်းချက်များကို လိုက်နာ ကျင့်သုံးရမည်။

၃။ အပိုဒ် ၁ (က) အရ သက်ဆိုင်သည့် သဘော်များသည် ရေမျက်နှာပြင်အောက် နစ်မြုပ်နိုင်သည့် ပြင်ပကိုယ်ထည်မျက်နှာပြင်ဧရိယာများတွင် ဘေးအန္တရာယ်ရှိသဘော်သုတ်ဆေးစနစ်များအား အသုံးမပြုရ။

၄။ ရေကြောင်းပို့ဆောင်ရေးညွှန်ကြားမှုဦးစီးဌာနသည် မြန်မာနိုင်ငံ ဆိပ်ကမ်းများသို့ ဝင်ရောက်လာသော သဘော်များ၏ ရေမျက်နှာပြင်အောက်နစ်မြုပ်နိုင်သည့် ပြင်ပကိုယ်ထည် မျက်နှာပြင်ဧရိယာများတွင် ဘေးအန္တရာယ်ရှိသုတ်ဆေးစနစ်များ အသုံးပြုထားခြင်း ရှိ မရှိ ကို သဘော်သုတ်ဆေးအားနမူနာရယူ၍လည်းကောင်း၊ သဘော်သုတ်ဆေးစနစ်အားလည်းကောင်း သတ်မှတ်ချက်များနှင့်အညီ စစ်ဆေးခြင်းပြုနိုင်သည်။

၅။ ဤညွှန်ကြားချက်နှင့်သက်ဆိုင်သည့် မြန်မာသဘော်အားလုံးသည် ရေမျက်နှာပြင်အောက် နစ်မြုပ်နိုင်သည့် ပြင်ပကိုယ်ထည် မျက်နှာပြင်ဧရိယာများတွင် ဘေးအန္တရာယ်မဖြစ်စေနိုင်သော သဘော်သုတ်ဆေးစနစ်အား ဤညွှန်ကြားချက်ထုတ်ပြန်သည့်နေ့ရက်နောက်ပိုင်း တည်ဆောက်သည့် သို့မဟုတ် အစောဆုံး လွန်းကျင်းတင်ပြင်ဆင်သည့်နေ့ရက်မှစ၍ လိုက်နာဆောင်ရွက်ရမည်။

၆။ ရေပေါ်တွင်းတူးစင်၊ ရေပေါ်သိုလှောင်ရုံ၊ ရေပေါ်သိုလှောင်ဖြန့်ဖြူးရေးရုံနှင့် ရေပေါ် ထုတ်လုပ်သိုလှောင်ဖြန့်ဖြူးရေးရုံတို့မှလွဲ၍ လုံးပေါင်းတန်ချိန် ၄၀၀ နှင့်အထက် မြန်မာသဘော်များသည် ရေကြောင်းပို့ဆောင်ရေးညွှန်ကြားမှုဦးစီးဌာန သို့မဟုတ် အသိအမှတ်ပြုအဖွဲ့အစည်း၏ သဘော်သုတ်ဆေးစနစ်များဆိုင်ရာတိုင်းတာစစ်ဆေးမှုကို ခံယူရမည်။

၇။ ရေကြောင်းပို့ဆောင်ရေးညွှန်ကြားမှုဦးစီးဌာန သို့မဟုတ် အသိအမှတ်ပြုအဖွဲ့အစည်းက အပိုဒ် ၂ တွင် ဖော်ပြထားသော နောက်ဆက်တွဲများပါ ပြဋ္ဌာန်းချက်များအတိုင်း တိုင်းတာစစ်ဆေးပြီး သတ်မှတ်ချက်များနှင့် ကိုက်ညီသည့် အပြည်ပြည်ဆိုင်ရာခရီးစဉ်သွား သို့မဟုတ် အိမ်နီးချင်းကမ်းရိုးတန်းခရီးစဉ်သွား လုံးပေါင်းတန်ချိန် ၄၀၀ နှင့်အထက် မြန်မာသဘော်များအား သဘော်သုတ်ဆေးစနစ်များဆိုင်ရာလက်မှတ် သို့မဟုတ် ထောက်ခံချက်လက်မှတ် ထုတ်ပေးရမည်။

၈။ ရေကြောင်းပို့ဆောင်ရေးညွှန်ကြားမှုဦးစီးဌာနသည် မြန်မာ့ကမ်းရိုးတန်းခရီးစဉ်သွား လုံးပေါင်းတန်ချိန် ၄၀၀ နှင့်အထက် မြန်မာသင်္ဘောများအား အပိုဒ် ၂ တွင် ဖော်ပြထားသော နောက်ဆက်တွဲများပါ ပြဋ္ဌာန်းချက်များအတိုင်း တိုင်းတာစစ်ဆေးပြီး သင်္ဘောသုတ်ဆေးစနစ်များဆိုင်ရာလက်မှတ် သို့မဟုတ် ထောက်ခံချက်လက်မှတ် ထုတ်ပေးရမည်။

၉။ လုံးပေါင်းတန်ချိန် ၄၀၀ အောက်၊ အလျား ၂၄ မီတာနှင့်အထက် မြန်မာသင်္ဘောများသည် ဘေးအန္တရာယ်ရှိသင်္ဘောသုတ်ဆေးစနစ်များအား အသုံးပြုထားခြင်းမရှိကြောင်း ကြေညာချက်နှင့်လိုအပ်သော အထောက်အထားများကို သင်္ဘောပေါ်တွင် သယ်ဆောင်ထားရှိရမည်။

၁၀။ ဤညွှန်ကြားချက်ပါ သတ်မှတ်ချက်များအတိုင်းလိုက်နာရမည့် သင်္ဘောများသည် သက်တမ်းရှိသည့် သင်္ဘောသုတ်ဆေးစနစ်များဆိုင်ရာလက်မှတ် သို့မဟုတ် ထောက်ခံချက်လက်မှတ် သို့မဟုတ် ဘေးအန္တရာယ်ရှိသင်္ဘောသုတ်ဆေးစနစ်များအား အသုံးပြုထားခြင်းမရှိကြောင်းကြေညာချက်အား သင်္ဘောပေါ်တွင် သယ်ဆောင်ထားခြင်းမရှိလျှင် မြန်မာ့ရေပြင်အတွင်းရှိ မည်သည့် ဆိပ်ကမ်း၊ သင်္ဘောကျင်း သို့မဟုတ် ကမ်းလွန်ဆိပ်ကမ်းတစ်ခုသို့ ဝင်ရောက်ခြင်းမပြုရ။

၁၁။ ရေကြောင်းပို့ဆောင်ရေးညွှန်ကြားမှုဦးစီးဌာနသည် မြန်မာသင်္ဘောတစ်စီးအား မှားယွင်းသော သတင်းအချက်အလက်များအပေါ်အခြေခံ၍ သင်္ဘောသုတ်ဆေးစနစ်များဆိုင်ရာလက်မှတ် ထုတ်ပေးထားခြင်း သို့မဟုတ် ထောက်ခံချက်လက်မှတ် ထုတ်ပေးထားခြင်းဖြစ်သည်ဟု ခိုင်လုံသောအကြောင်းရှိလျှင်ဖြစ်စေ၊ သင်္ဘော၏သုတ်ဆေး သို့မဟုတ် သုတ်ဆေးစနစ် အခြေအနေချို့ယွင်းမှုတွေ့ရှိလျှင်ဖြစ်စေ ရေယာဉ်မှူးနှင့် သင်္ဘောပိုင်ရှင်ထံသို့ အကြောင်းကြားစာပေးပို့၍ ထုတ်ပေးထားသော သင်္ဘောသုတ်ဆေးစနစ်များဆိုင်ရာလက်မှတ် သို့မဟုတ် ထောက်ခံချက်လက်မှတ်ကို ပြန်လည်အပ်နှံစေခြင်း သို့မဟုတ် ဖျက်သိမ်းခြင်းပြုနိုင်သည်။

၁၂။ ရေကြောင်းပို့ဆောင်ရေးညွှန်ကြားမှုဦးစီးဌာနသည် အပိုဒ် ၁ (က) နှင့် သက်ဆိုင်သော သင်္ဘောများက ဤညွှန်ကြားချက်အတိုင်း လိုက်နာမှုရှိစေရန် လိုအပ်သောအရေးယူဆောင်ရွက်ခြင်းများပြုရမည်။

ဒေါက်တာကိုကိုနိုင်
ခေတ္တညွှန်ကြားရေးမှူးချုပ်

စာအမှတ်၊ ရည၊ ညွှန်ကြားချက်/ ၁၀၀၉
ရက်စွဲ၊ ၂၀၂၃ ခုနှစ်၊ ဇူလိုင်လ ၂၀ ရက်

ဖြန့်ဝေခြင်း

ငါးလုပ်ငန်းဦးစီးဌာန

ရေအရင်းအမြစ်နှင့်မြစ်ချောင်းများဖွံ့ဖြိုးတိုးတက်ရေးဦးစီးဌာန

မြန်မာ့ဆိပ်ကမ်းအာဏာပိုင်

ပြည်တွင်းရေကြောင်းပို့ဆောင်ရေး

မြန်မာ့သဘော်ဘကျင်းလုပ်ငန်း

မြန်မာ့ပုလဲထုတ်လုပ်ရေးနှင့် ရောင်းဝယ်ရေးလုပ်ငန်း

သတ္တုတွင်းလုပ်ငန်း

မြန်မာ့ရေနံနှင့် သဘာဝဓာတ်ငွေ့လုပ်ငန်း

အသိအမှတ်ပြုအဖွဲ့အစည်းများ (Recognized Organizations)

မြန်မာ့ကြယ်ငါးပွင့်သဘော်လုပ်ငန်းကုမ္ပဏီလီမိတက်

နိုင်ငံခြားသွားသဘော်ပိုင်ရှင်များအသင်း

ကမ်းရိုးတန်းသွားရေယာဉ်ပိုင်ရှင်များအသင်း

မြန်မာနိုင်ငံကမ်းရိုးတန်းသွားကုန်တင်ရေယာဉ်များအသင်း

ပြည်တွင်းရေကြောင်းသွားရေယာဉ်ပိုင်ရှင်များအသင်း

ညွှန်ကြားရေးမှူးချုပ်
ပုံနှိပ်ရေးနှင့်ထုတ်ဝေရေးဦးစီးဌာန

} ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်ပြန်တမ်း အပိုင်း(၁)တွင် ထည့်သွင်းကြေညာပေးပါရန် မေတ္တာရပ်ခံချက်ဖြင့် ပေးပို့ပါသည်။

မိတ္တူကို

- ပို့ဆောင်ရေးနှင့်ဆက်သွယ်ရေးဝန်ကြီးဌာန၊
- ဥပဒေရေးရာဝန်ကြီးဌာန၊
- စိုက်ပျိုးရေး၊ မွေးမြူရေးနှင့်ဆည်မြောင်းဝန်ကြီးဌာန၊
- သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန၊
- စွမ်းအင်ဝန်ကြီးဌာန၊
- ရုံးလက်ခံ။

Anti-fouling Systems

International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001 (AFS 2001)

Contents

INTERNATIONAL CONVENTION ON THE CONTROL OF HARMFUL ANTI-FOULING SYSTEMS ON SHIPS, 2001

THE PARTIES TO THIS CONVENTION,

NOTING that scientific studies and investigations by Governments and competent international organizations have shown that certain anti-fouling systems used on ships pose a substantial risk of toxicity and other chronic impacts to ecologically and economically important marine organisms and also that human health may be harmed as a result of the consumption of affected seafood,

NOTING IN PARTICULAR the serious concern regarding anti-fouling systems that use organotin compounds as biocides and being convinced that the introduction of such organotins into the environment must be phased-out,

RECALLING that Chapter 17 of Agenda 21 adopted by the United Nations Conference on Environment and Development, 1992, calls upon States to take measures to reduce pollution caused by organotin compounds used in anti-fouling systems,

RECALLING ALSO that resolution A.895(21), adopted by the Assembly of the International Maritime Organization on 25 November 1999, urges the Organization's Marine Environment Protection Committee (MEPC) to work towards the expeditious development of a global legally binding instrument to address the harmful effects of anti-fouling systems as a matter of urgency,

MINDFUL OF the precautionary approach set out in Principle 15 of the Rio Declaration on Environment and Development and referred to in resolution MEPC.67(37) adopted by MEPC on 15 September 1995,

RECOGNIZING the importance of protecting the marine environment and human health from adverse effects of anti-fouling systems,

RECOGNIZING ALSO that the use of anti-fouling systems to prevent the build-up of organisms on the surface of ships is of critical importance to efficient commerce, shipping and impeding the spread of harmful aquatic organisms and pathogens,

RECOGNIZING FURTHER the need to continue to develop anti-fouling systems which are effective and environmentally safe and to promote the substitution of harmful systems by less harmful systems or preferably harmless systems,

HAVE AGREED as follows:

Article 1
General obligations

(1) Each Party to this Convention undertakes to give full and complete effect to its provisions in order to reduce or eliminate adverse effects on the marine environment and human health caused by anti-fouling systems.

(2) The annexes form an integral part of this Convention. Unless expressly provided otherwise, a reference to this Convention constitutes at the same time a reference to its annexes.

(3) No provision of this Convention shall be interpreted as preventing a State from taking, individually or jointly, more stringent measures with respect to the reduction or elimination of adverse effects of anti-fouling systems on the environment, consistent with international law.

(4) Parties shall endeavour to co-operate for the purpose of effective implementation, compliance and enforcement of this Convention.

(5) The Parties undertake to encourage the continued development of anti-fouling systems that are effective and environmentally safe.

Article 2
Definitions

For the purposes of this Convention, unless expressly provided otherwise:

(1) *Administration* means the Government of the State under whose authority the ship is operating. With respect to a ship entitled to fly a flag of a State, the Administration is the Government of that State. With respect to fixed or floating platforms engaged in exploration and exploitation of the sea-bed and subsoil thereof adjacent to the coast over which the coastal State exercises sovereign rights for the purposes of exploration and exploitation of their natural resources, the Administration is the Government of the coastal State concerned.

(2) *Anti-fouling system* means a coating, paint, surface treatment, surface, or device that is used on a ship to control or prevent attachment of unwanted organisms.

(3) *Committee* means the Marine Environment Protection Committee of the Organization.

(4) *Gross tonnage* means the gross tonnage calculated in accordance with the tonnage measurement regulations contained in annex 1 to the International Convention on Tonnage Measurement of Ships, 1969, or any successor Convention.

(5) *International voyage* means a voyage by a ship entitled to fly the flag of one State to or from a port, shipyard, or offshore terminal under the jurisdiction of another State.

(6) *Length* means the length as defined in the International Convention on Load Lines, 1966, as modified by the Protocol of 1988 relating thereto, or any successor Convention.

(7) *Organization* means the International Maritime Organization.

(8) *Secretary-General* means the Secretary-General of the Organization.

(9) *Ship* means a vessel of any type whatsoever operating in the marine environment and includes hydrofoil boats, air-cushion vehicles, submersibles, floating craft, fixed or floating platforms, floating storage units (FSUs) and floating production storage and off-loading units (FPSOs).

(10) *Technical Group* is a body comprised of representatives of the Parties, Members of the Organization, the United Nations and its Specialized Agencies, intergovernmental organizations having agreements with the Organization, and non-governmental organizations in consultative status with the Organization, which should preferably include representatives of institutions and laboratories that engage in anti-fouling system analysis. These representatives shall have expertise in environmental fate and effects, toxicological effects, marine biology, human health, economic analysis, risk management, international shipping, anti-fouling systems coating technology, or other fields of expertise necessary to objectively review the technical merits of a comprehensive proposal.

Article 3
Application

(1) Unless otherwise specified in this Convention, this Convention shall apply to:

(a) ships entitled to fly the flag of a Party;

(b) ships not entitled to fly the flag of a Party, but which operate under the authority of a Party; and

(c) ships that enter a port, shipyard, or offshore terminal of a Party, but do not fall within subparagraph (a) or (b).

(2) This Convention shall not apply to any warships, naval auxiliary, or other ships owned or operated by a Party and used, for the time being, only on government non-commercial service. However, each Party shall ensure, by the adoption of appropriate measures not impairing operations or operational capabilities of such ships owned or operated by it, that such ships act in a manner consistent, so far as is reasonable and practicable, with this Convention.

(3) With respect to the ships of non-Parties to this Convention, Parties shall apply the requirements of this Convention as may be necessary to ensure that no more favourable treatment is given to such ships.

Article 4
Controls on anti-fouling systems

(1) In accordance with the requirements specified in annex 1, each Party shall prohibit and/or restrict:

(a) the application, re-application, installation, or use of harmful anti-fouling systems on ships referred to in article 3(1)(a) or (b); and

(b) the application, re-application, installation or use of such systems, whilst in a Party's port, shipyard, or offshore terminal, on ships referred to in article 3(1)(c),

and shall take effective measures to ensure that such ships comply with those requirements.

(2) Ships bearing an anti-fouling system which is controlled through an amendment to annex 1 following entry into force of this Convention may retain that system until the next scheduled renewal of that system, but in no event for a period exceeding 60 months following application, unless the Committee decides that exceptional circumstances exist to warrant earlier implementation of the control.

Article 5
Controls of annex 1 waste materials

Taking into account international rules, standards and requirements, a Party shall take appropriate measures in its territory to require that wastes from the application or removal of an anti-fouling system controlled in annex 1 are collected, handled, treated and disposed of in a safe and environmentally sound manner to protect human health and the environment.

Article 6
Process for proposing amendments to controls on anti-fouling systems

(1) Any Party may propose an amendment to annex 1 in accordance with this article.

(2) An initial proposal shall contain the information required in annex 2, and shall be submitted to the Organization. When the Organization receives a proposal, it shall bring the proposal to the attention of the Parties, Members of the Organization, the United Nations and its Specialized Agencies, intergovernmental organizations having agreements with the Organization and non-governmental organizations in consultative status with the Organization and shall make it available to them.

(3) The Committee shall decide whether the anti-fouling system in question warrants a more in-depth review based on the initial proposal. If the Committee decides that further review is warranted, it shall require the proposing Party to submit to the Committee a comprehensive proposal containing the information required in annex 3, except where the initial proposal also includes all the information required in annex 3. Where the Committee is of the view that there is a threat of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason to prevent a decision to proceed with the evaluation of the proposal. The Committee shall establish a technical group in accordance with article 7.

(4) The technical group shall review the comprehensive proposal along with any additional data submitted by any interested entity and shall evaluate and report to the Committee whether the proposal has demonstrated a

potential for unreasonable risk of adverse effects on non-target organisms or human health such that the amendment of annex 1 is warranted. In this regard:

(a) The technical group's review shall include:

(i) an evaluation of the association between the anti-fouling system in question and the related adverse effects observed either in the environment or on human health, including, but not limited to, the consumption of affected seafood, or through controlled studies based on the data described in annex 3 and any other relevant data which come to light;

(ii) an evaluation of the potential risk reduction attributable to the proposed control measures and any other control measures that may be considered by the technical group;

(iii) consideration of available information on the technical feasibility of control measures and the cost-effectiveness of the proposal;

(iv) consideration of available information on other effects from the introduction of such control measures relating to:

- the environment (including, but not limited to, the cost of inaction and the impact on air quality);
- shipyard health and safety concerns (i.e. effects on shipyard workers);
- the cost to international shipping and other relevant sectors; and

(v) consideration of the availability of suitable alternatives, including a consideration of the potential risks of alternatives.

(b) The technical group's report shall be in writing and shall take into account each of the evaluations and considerations referred to in subparagraph (a), except that the technical group may decide not to proceed with the evaluations and considerations described in subparagraph (a)(ii) through (a)(v) if it determines after the evaluation in subparagraph (a)(i) that the proposal does not warrant further consideration.

(c) The technical group's report shall include, *inter alia*, a recommendation on whether international controls pursuant to this Convention are warranted on the anti-fouling system in question, on the suitability of the specific control measures suggested in the comprehensive proposal, or on other control measures which it believes to be more suitable.

(5) The technical group's report shall be circulated to the Parties, Members of the Organization, the United Nations and its Specialized Agencies, intergovernmental organizations having agreements with the Organization and non-governmental organizations in consultative status with the Organization, prior to its consideration by the Committee. The Committee shall decide whether to approve any proposal to amend annex 1, and any modifications thereto, if appropriate, taking into account the technical group's report. If the report finds a threat of serious or irreversible damage, lack of full scientific certainty shall not, itself, be used as a reason to

prevent a decision from being taken to list an anti-fouling system in annex 1. The proposed amendments to annex 1, if approved by the Committee, shall be circulated in accordance with article 16(2)(a). A decision not to approve the proposal shall not preclude future submission of a new proposal with respect to a particular anti-fouling system if new information comes to light.

(6) Only Parties may participate in decisions taken by the Committee described in paragraphs (3) and (5).

Article 7
Technical groups

(1) The Committee shall establish a technical group pursuant to article 6 when a comprehensive proposal is received. In circumstances where several proposals are received concurrently or sequentially, the Committee may establish one or more technical groups as needed.

(2) Any Party may participate in the deliberations of a technical group, and should draw on the relevant expertise available to that Party.

(3) The Committee shall decide on the terms of reference, organization and operation of the technical groups. Such terms shall provide for protection of any confidential information that may be submitted. Technical groups may hold such meetings as required, but shall endeavour to conduct their work through written or electronic correspondence or other media as appropriate.

(4) Only the representatives of Parties may participate in formulating any recommendation to the Committee pursuant to article 6. A technical group shall endeavour to achieve unanimity among the representatives of the Parties. If unanimity is not possible, the technical group shall communicate any minority views of such representatives.

Article 8
Scientific and technical research and monitoring

(1) The Parties shall take appropriate measures to promote and facilitate scientific and technical research on the effects of anti-fouling systems as well as monitoring of such effects. In particular, such research should include observation, measurement, sampling, evaluation and analysis of the effects of anti-fouling systems.

(2) Each Party shall, to further the objectives of this Convention, promote the availability of relevant information to other Parties who request it on:

(a) scientific and technical activities undertaken in accordance with this Convention;

(b) marine scientific and technological programmes and their objectives; and

(c) the effects observed from any monitoring and assessment programmes relating to anti-fouling systems.

Article 9
Communication and exchange of information

(1) Each Party undertakes to communicate to the Organization:

(a) a list of the nominated surveyors or recognized organizations which are authorized to act on behalf of that Party in the administration of matters relating to the control of anti-fouling systems in accordance with this Convention for circulation to the Parties for the information of their officers. The Administration shall therefore notify the Organization of the specific responsibilities and conditions of the authority delegated to nominated surveyors or recognized organizations; and

(b) on an annual basis, information regarding any anti-fouling systems approved, restricted, or prohibited under its domestic law.

(2) The Organization shall make available, through any appropriate means, information communicated to it under paragraph (1).

(3) For those anti-fouling systems approved, registered or licensed by a Party, such Party shall either provide, or require the manufacturers of such anti-fouling systems to provide, to those Parties which request it, relevant information on which its decision was based, including information provided for in annex 3, or other information suitable for making an appropriate evaluation of the anti-fouling system. No information shall be provided that is protected by law.

Article 10
Survey and certification

A Party shall ensure that ships entitled to fly its flag or operating under its authority are surveyed and certified in accordance with the regulations in annex 4.

Article 11
Inspections of ships and detection of violations

(1) A ship to which this Convention applies may, in any port, shipyard, or offshore terminal of a Party, be inspected by officers authorized by that Party for the purpose of determining whether the ship is in compliance with this Convention. Unless there are clear grounds for believing that a ship is in violation of this Convention, any such inspection shall be limited to:

(a) verifying that, where required, there is on board a valid International Anti-Fouling System Certificate or a Declaration on Anti-Fouling System; and/or

(b) a brief sampling of the ship's anti-fouling system that does not affect the integrity, structure, or operation of the anti-fouling system taking into account guidelines developed by the Organization.*

---

* Refer to the Guidelines for brief sampling of anti-fouling systems on ships adopted by the Marine Environment Protection Committee of the Organization by resolution MEPC.104(49) and attached on page 41 of this publication.

(3) The sanctions established under the laws of a Party pursuant to this article shall be adequate in severity to discourage violations of this Convention wherever they occur.

Article 13
Undue delay or detention of ships

(1) All possible efforts shall be made to avoid a ship being unduly detained or delayed under article 11 or 12.

(2) When a ship is unduly detained or delayed under article 11 or 12, it shall be entitled to compensation for any loss or damage suffered.

Article 14
Dispute settlement

Parties shall settle any dispute between them concerning the interpretation or application of this Convention by negotiation, enquiry, mediation, conciliation, arbitration, judicial settlement, resort to regional agencies or arrangements, or other peaceful means of their own choice.

Article 15
Relationship to international law of the sea

Nothing in this Convention shall prejudice the rights and obligations of any State under customary international law as reflected in the United Nations Convention on the Law of the Sea.

Article 16
Amendments

(1) This Convention may be amended by either of the procedures specified in the following paragraphs.

(2) Amendments after consideration within the Organization:

(a) Any Party may propose an amendment to this Convention. A proposed amendment shall be submitted to the Secretary-General, who shall then circulate it to the Parties and Members of the Organization at least six months prior to its consideration. In the case of a proposal to amend annex 1, it shall be processed in accordance with article 6, prior to its consideration under this article.

(b) An amendment proposed and circulated as above shall be referred to the Committee for consideration. Parties, whether or not Members of the Organization, shall be entitled to participate in the proceedings of the Committee for consideration and adoption of the amendment.

(c) Amendments shall be adopted by a two-thirds majority of the Parties present and voting in the Committee, on condition that at least one third of the Parties shall be present at the time of voting.

(d) Amendments adopted in accordance with subparagraph (c) shall be communicated by the Secretary-General to the Parties for acceptance.

(e) An amendment shall be deemed to have been accepted in the following circumstances:

(i) An amendment to an article of this Convention shall be deemed to have been accepted on the date on which two thirds of the Parties have notified the Secretary-General of their acceptance of it.

(ii) An amendment to an annex shall be deemed to have been accepted at the end of twelve months after the date of adoption or such other date as determined by the Committee. However, if by that date more than one third of the Parties notify the Secretary-General that they object to the amendment, it shall be deemed not to have been accepted.

(f) An amendment shall enter into force under the following conditions:

(i) An amendment to an article of this Convention shall enter into force for those Parties that have declared that they have accepted it six months after the date on which it is deemed to have been accepted in accordance with subparagraph (e)(i).

(ii) An amendment to annex 1 shall enter into force with respect to all Parties six months after the date on which it is deemed to have been accepted, except for any Party that has:

(1) notified its objection to the amendment in accordance with subparagraph (e)(ii) and that has not withdrawn such objection;

(2) notified the Secretary-General, prior to the entry into force of such amendment, that the amendment shall enter into force for it only after a subsequent notification of its acceptance; or

(3) made a declaration at the time it deposits its instrument of ratification, acceptance or approval of, or accession to, this Convention that amendments to annex 1 shall enter into force for it only after the notification to the Secretary-General of its acceptance with respect to such amendments.

(iii) An amendment to an annex other than annex 1 shall enter into force with respect to all Parties six months after the date on which it is deemed to have been accepted, except for those Parties that have notified their objection to the amendment in accordance with subparagraph (e)(ii) and that have not withdrawn such objection.

(g) **(i)** A Party that has notified an objection under subparagraph (f)(ii)(1) or (iii) may subsequently notify the Secretary-General that it accepts the amendment. Such amendment shall enter into force for such Party six months after the date of its notification of acceptance, or the date on which the amendment enters into force, whichever is the later date.

(ii) If a Party that has made a notification or declaration referred to in subparagraph (f)(ii)(2) or (3), respectively, notifies the Secretary-General of its acceptance with respect to an amendment, such amendment shall enter into force for such Party six months after the date of its notification of acceptance, or the date on which the amendment enters into force, whichever is the later date.

(3) Amendment by a Conference:

(a) Upon the request of a Party concurred in by at least one-third of the Parties, the Organization shall convene a Conference of Parties to consider amendments to this Convention.

(b) An amendment adopted by such a Conference by a two-thirds majority of the Parties present and voting shall be communicated by the Secretary-General to all Parties for acceptance.

(c) Unless the Conference decides otherwise, the amendment shall be deemed to have been accepted and shall enter into force in accordance with the procedures specified in paragraphs (2)(e) and (f) respectively of this article.

(4) Any Party that has declined to accept an amendment to an annex shall be treated as a non-Party only for the purpose of application of that amendment.

(5) An addition of a new annex shall be proposed and adopted and shall enter into force in accordance with the procedure applicable to an amendment to an article of this Convention.

(6) Any notification or declaration under this article shall be made in writing to the Secretary-General.

(7) The Secretary-General shall inform the Parties and Members of the Organization of:

(a) any amendment that enters into force and the date of its entry into force generally and for each Party; and

(b) any notification or declaration made under this article.

Article 17
Signature, ratification, acceptance, approval and accession

(1) This Convention shall be open for signature by any State at the Headquarters of the Organization from 1 February 2002 to 31 December 2002 and shall thereafter remain open for accession by any State.

(2) States may become Parties to this Convention by:

(a) signature not subject to ratification, acceptance, or approval; or

(b) signature subject to ratification, acceptance, or approval, followed by ratification, acceptance, or approval; or

(c) accession.

(3) Ratification, acceptance, approval, or accession shall be effected by the deposit of an instrument to that effect with the Secretary-General.

(4) If a State comprises two or more territorial units in which different systems of law are applicable in relation to matters dealt with in this Convention, it may at the time of signature, ratification, acceptance, approval, or accession declare that this Convention shall extend to all its territorial units or only to one or more of them and may modify this declaration by submitting another declaration at any time.

(5) Any such declaration shall be notified to the Secretary-General and shall state expressly the territorial units to which this Convention applies.

Article 18
Entry into force

(1) This Convention shall enter into force twelve months after the date on which not less than twenty-five States, the combined merchant fleets of which constitute not less than twenty-five per cent of the gross tonnage of the world's merchant shipping, have either signed it without reservation as to ratification, acceptance or approval, or have deposited the requisite instrument of ratification, acceptance, approval or accession in accordance with article 17.

(2) For States which have deposited an instrument of ratification, acceptance, approval or accession in respect of this Convention after the requirements for entry into force thereof have been met, but prior to the date of entry into force, the ratification, acceptance, approval or accession shall take effect on the date of entry into force of this Convention or three months after the date of deposit of instrument, whichever is the later date.

(3) Any instrument of ratification, acceptance, approval or accession deposited after the date on which this Convention enters into force shall take effect three months after the date of deposit.

(4) After the date on which an amendment to this Convention is deemed to have been accepted under article 16, any instrument of ratification, acceptance, approval or accession deposited shall apply to the Convention as amended.

Article 19
Denunciation

(1) This Convention may be denounced by any Party at any time after the expiry of two years from the date on which this Convention enters into force for that Party.

(2) Denunciation shall be effected by the deposit of written notification with the Secretary-General, to take effect one year after receipt or such longer period as may be specified in that notification.

Article 20
Depositary

(1) This Convention shall be deposited with the Secretary-General, who shall transmit certified copies of this Convention to all States which have signed this Convention or acceded thereto.

(2) In addition to the functions specified elsewhere in this Convention, the Secretary-General shall:

(a) inform all States which have signed this Convention or acceded thereto of:

(i) each new signature or deposit of an instrument of ratification, acceptance, approval, or accession, together with the date thereof;

(ii) the date of entry into force of this Convention; and

(iii) the deposit of any instrument of denunciation of this Convention, together with the date on which it was received and the date on which the denunciation takes effect; and

(b) as soon as this Convention enters into force, transmit the text thereof to the Secretariat of the United Nations for registration and publication in accordance with Article 102 of the Charter of the United Nations.

Article 21
Languages

This Convention is established in a single original in the Arabic, Chinese, English, French, Russian and Spanish languages, each text being equally authentic.

IN WITNESS WHEREOF the undersigned being duly authorized by their respective Governments for that purpose have signed this Convention.*

DONE AT LONDON, this fifth day of October, two thousand and one.

---

* Signatures omitted.

Annex 1
Controls on anti-fouling systems

Anti-fouling system	Control measures	Application	Effective date
Organotin compounds which act as biocides in anti-fouling systems	Ships shall not apply or reapply such compounds	All ships	1 January 2003
Organotin compounds which act as biocides in anti-fouling systems	Ships either: (1) shall not bear such compounds on their hulls or external parts or surfaces; or (2) shall bear a coating that forms a barrier to such compounds leaching from the underlying non-compliant anti-fouling systems	All ships (except fixed and floating platforms, FSUs, and FPSOs that have been constructed prior to 1 January 2003 and that have not been in dry-dock on or after 1 January 2003)	1 January 2008

Annex 2

Required elements for an initial proposal

(1) An initial proposal shall include adequate documentation containing at least the following:

(a) identification of the anti-fouling system addressed in the proposal: name of the anti-fouling system; name of active ingredients and Chemical Abstracts Service Registry Number (CAS number), as applicable; or components of the system which are suspected of causing the adverse effects of concern;

(b) characterization of the information which suggests that the anti-fouling system or its transformation products may pose a risk to human health or may cause adverse effects in non-target organisms at concentrations likely to be found in the environment (e.g., the results of toxicity studies on representative species or bioaccumulation data);

(c) material supporting the potential of the toxic components in the anti-fouling system, or its transformation products, to occur in the environment at concentrations which could result in adverse effects to non-target organisms, human health, or water quality (e.g., data on persistence in the water column, sediments and biota; the release rate of toxic components from treated surfaces in studies or under actual use conditions; or monitoring data, if available);

(d) an analysis of the association between the anti-fouling system, the related adverse effects and the environmental concentrations observed or anticipated; and

(e) a preliminary recommendation on the type of restrictions that could be effective in reducing the risks associated with the anti-fouling system.

(2) An initial proposal shall be submitted in accordance with rules and procedures of the Organization.

Annex 3
Required elements of a comprehensive proposal

(1) A comprehensive proposal shall include adequate documentation containing the following:

(a) developments in the data cited in the initial proposal;

(b) findings from the categories of data set out in paragraphs (3)(a), (b) and (c), as applicable, depending on the subject of the proposal and the identification or description of the methodologies under which the data were developed;

(c) a summary of the results of studies conducted on the adverse effects of the anti-fouling system;

(d) if any monitoring has been conducted, a summary of the results of that monitoring, including information on ship traffic and a general description of the area monitored;

(e) a summary of the available data on environmental or ecological exposure and any estimates of environmental concentrations developed through the application of mathematical models, using all available environmental fate parameters, preferably those which were determined experimentally, along with an identification or description of the modelling methodology;

(f) an evaluation of the association between the anti-fouling system in question, the related adverse effects and the environmental concentrations, either observed or expected;

(g) a qualitative statement of the level of uncertainty in the evaluation referred to in subparagraph (f);

(h) a recommendation of specific control measures to reduce the risks associated with the anti-fouling system; and

(i) a summary of the results of any available studies on the potential effects of the recommended control measures relating to air quality, shipyard conditions, international shipping and other relevant sectors, as well as the availability of suitable alternatives.

(2) A comprehensive proposal shall also include information on each of the following physical and chemical properties of the component(s) of concern, if applicable:

- melting point;
- boiling point;
- density (relative density);
- vapour pressure;
- water solubility/pH/dissociation constant (pK_a);
- oxidation/reduction potential;

- molecular mass;
- molecular structure; and
- other physical and chemical properties identified in the initial proposal.

(3) For the purposes of paragraph (1)(b) above, the categories of data are:

(a) Data on environmental fate and effect:

- modes of degradation/dissipation (e.g., hydrolysis/photo-degradation/biodegradation);
- persistence in the relevant media (e.g., water column/sediments/biota);
- sediments/water partitioning;
- leaching rates of biocides or active ingredients;
- mass balance;
- bioaccumulation, partition coefficient, octanol/water coefficient; and
- any novel reactions on release or known interactive effects.

(b) Data on any unintended effects in aquatic plants, invertebrates, fish, seabirds, marine mammals, endangered species, other biota, water quality, the sea-bed, or habitat of non-target organisms, including sensitive and representative organisms:

- acute toxicity;
- chronic toxicity;
- developmental and reproductive toxicity;
- endocrine disruption;
- sediment toxicity;
- bioavailability/biomagnification/bioconcentration;
- food web/population effects;
- observations of adverse effects in the field/fish kills/strandings/tissue analysis; and
- residues in seafood.

These data shall relate to one or more types of non-target organisms such as aquatic plants, invertebrates, fish, birds, mammals and endangered species.

(c) Data on the potential for human health effects (including, but not limited to, consumption of affected seafood).

(4) A comprehensive proposal shall include a description of the methodologies used, as well as any relevant measures taken for quality assurance and any peer review conducted of the studies.

Annex 4
Surveys and certification requirements for anti-fouling systems

Regulation 1
Surveys

(1) Ships of 400 gross tonnage and above referred to in article 3(1)(a) engaged in international voyages, excluding fixed or floating platforms, FSUs, and FPSOs, shall be subject to surveys specified below:

(a) an initial survey before the ship is put into service or before the International Anti-Fouling System Certificate (Certificate) required under regulation 2 or 3 is issued for the first time; and

(b) a survey when the anti-fouling systems are changed or replaced. Such surveys shall be endorsed on the Certificate issued under regulation 2 or 3.

(2) The survey shall be such as to ensure that the ship's anti-fouling system fully complies with this Convention.

(3) The Administration shall establish appropriate measures for ships that are not subject to the provisions of paragraph (1) of this regulation in order to ensure that this Convention is complied with.

(4) **(a)** As regards the enforcement of this Convention, surveys of ships shall be carried out by officers duly authorized by the Administration or as provided in regulation 3(1), taking into account guidelines for surveys developed by the Organization.* Alternatively, the Administration may entrust surveys required by this Convention either to surveyors nominated for that purpose or to organizations recognized by it.

(b) An Administration nominating surveyors or recognizing organizations† to conduct surveys shall, as a minimum, empower any nominated surveyor or recognized organization to:

(i) require a ship that it surveys to comply with the provisions of annex 1; and

(ii) carry out surveys if requested by the appropriate authorities of a port State that is a Party to this Convention.

---

* Refer to the Guidelines for survey and certification of anti-fouling systems on ships adopted by the Marine Environment Protection Committee of the Organization by resolution MEPC.102(48) and attached on page 33 of this publication.

† Refer to the guidelines adopted by the Organization by resolution A.739(18), as may be amended by the Organization, and the specifications adopted by the Organization by resolution A.789(19), as may be amended by the Organization.

(c) When the Administration, a nominated surveyor, or a recognized organization determines that the ship's anti-fouling system does not conform either to the particulars of a Certificate required under regulation 2 or 3, or to the requirements of this Convention, such Administration, surveyor or organization shall immediately ensure that corrective action is taken to bring the ship into compliance. A surveyor or organization shall also in due course notify the Administration of any such determination. If the required corrective action is not taken, the Administration shall be notified forthwith and it shall ensure that the Certificate is not issued or is withdrawn as appropriate.

(d) In the situation described in subparagraph (c), if the ship is in the port of another Party, the appropriate authorities of the port State shall be notified forthwith. When the Administration, a nominated surveyor, or a recognized organization has notified the appropriate authorities of the port State, the Government of the port State concerned shall give such Administration, surveyor, or organization any necessary assistance to carry out their obligations under this regulation, including any action described in article 11 or 12.

Regulation 2

Issue or endorsement of an International Anti-Fouling System Certificate

(1) The Administration shall require that a ship to which regulation 1 applies is issued with a Certificate after successful completion of a survey in accordance with regulation 1. A Certificate issued under the authority of a Party shall be accepted by the other Parties and regarded for all purposes covered by this Convention as having the same validity as a Certificate issued by them.

(2) Certificates shall be issued or endorsed either by the Administration or by any person or organization duly authorized by it. In every case, the Administration assumes full responsibility for the Certificate.

(3) For ships bearing an anti-fouling system controlled under annex 1 that was applied before the date of entry into force of a control for such a system, the Administration shall issue a Certificate in accordance with paragraphs (2) and (3) of this regulation not later than two years after entry into force of that control. This paragraph shall not affect any requirement for ships to comply with annex 1.

(4) The Certificate shall be drawn up in the form corresponding to the model given in appendix 1 to this annex and shall be written at least in English, French, or Spanish. If an official language of the issuing State is also used this shall prevail in the case of the dispute or discrepancy.

Regulation 3
Issue or endorsement of an International Anti-Fouling System Certificate by another Party

(1) At the request of the Administration, another Party may cause a ship to be surveyed and, if satisfied that this Convention has been complied with, it shall issue or authorize the issue of a Certificate to the ship and, where appropriate, endorse or authorize the endorsement of that Certificate for the ship, in accordance with this Convention.

(2) A copy of the Certificate and a copy of the survey report shall be transmitted as soon as possible to the requesting Administration.

(3) A Certificate so issued shall contain a statement that it has been issued at the request of the Administration referred to in paragraph (1) and it shall have the same force and receive the same recognition as a Certificate issued by the Administration.

(4) No Certificate shall be issued to a ship which is entitled to fly the flag of a State which is not a Party.

Regulation 4
Validity of an International Anti-Fouling System Certificate

(1) A Certificate issued under regulation 2 or 3 shall cease to be valid in either of the following cases:

(a) if the anti-fouling system is changed or replaced and the Certificate is not endorsed in accordance with this Convention; and

(b) upon transfer of the ship to the flag of another State. A new Certificate shall only be issued when the Party issuing the new Certificate is fully satisfied that the ship is in compliance with this Convention. In the case of a transfer between Parties, if requested within three months after the transfer has taken place, the Party whose flag the ship was formerly entitled to fly shall, as soon as possible, transmit to the Administration a copy of the Certificates carried by the ship before the transfer and, if available, a copy of the relevant survey reports.

(2) The issue by a Party of a new Certificate to a ship transferred from another Party may be based on a new survey or on a valid Certificate issued by the previous Party whose flag the ship was entitled to fly.

Regulation 5
Declaration on Anti-Fouling System

(1) The Administration shall require a ship of 24 metres or more in length, but less than 400 gross tonnage engaged in international voyages and to which article 3(1)(a) applies (excluding fixed or floating platforms, FSUs, and FPSOs) to carry a Declaration signed by the owner or owner's authorized

agent. Such Declaration shall be accompanied by appropriate documentation (such as a paint receipt or a contractor invoice) or contain appropriate endorsement.

(2) The Declaration shall be drawn up in the form corresponding to the model given in appendix 2 to this annex and shall be written at least in English, French, or Spanish. If an official language of the State whose flag the ship is entitled to fly is also used, this shall prevail in the case of a dispute or discrepancy.

Appendix 1 to annex 4

MODEL FORM OF INTERNATIONAL ANTI-FOULING SYSTEM CERTIFICATE

INTERNATIONAL ANTI-FOULING SYSTEM CERTIFICATE

(This certificate shall be supplemented by a Record of Anti-Fouling Systems)

(Official seal) *(State)*

Issued under the
International Convention on the Control of Harmful Anti-Fouling Systems on Ships

under the authority of the Government of

. . . . . .

(name of the State)

by

. . . . . .

(person or organization authorized)

When a Certificate has been previously issued, this Certificate replaces the certificate dated . . . . . .

Particulars of ship[1]

Name of ship . . . . . .

Distinctive number or letters . . . . . .

Port of registry . . . . . .

Gross tonnage . . . . . .

IMO number[2] . . . . . .

An anti-fouling system controlled under annex 1 has not been applied during or after construction of this ship ☐

An anti-fouling system controlled under annex 1 has been applied on this ship previously, but has been removed by . . . . . *(insert name of the facility)* on . . . . . *(date)* ☐

An anti-fouling system controlled under annex 1 has been applied on this ship previously, but has been covered with a sealer coat applied by . . . . . *(insert name of the facility)* on . . . . . *(date)* ☐

An anti-fouling system controlled under annex 1 was applied on this ship prior to . . . . . *(date)*,[3] but must be removed or covered with a sealer coat prior to . . . . . *(date)*[4] ☐

---

[1] Alternatively, the particulars of the ship may be placed horizontally in boxes.

[2] In accordance with the IMO Ship Identification Number Scheme adopted by the Organization with Assembly resolution A.600(15).

[3] Date of entry into force of the control measure.

[4] Date of expiration of any implementation period specified in article 4(2) or annex 1.

THIS IS TO CERTIFY THAT:

1 the ship has been surveyed in accordance with regulation 1 of annex 4 to the Convention; and

2 the survey shows that the anti-fouling system on the ship complies with the applicable requirements of annex 1 to the Convention.

Issued at .....

(Place of issue of Certificate)

....

(Date of issue) *(Signature of authorized official issuing the Certificate)*

Date of completion of the survey
on which this certificate is issued: .....

MODEL FORM OF RECORD OF ANTI-FOULING SYSTEMS

RECORD OF ANTI-FOULING SYSTEMS

This Record shall be permanently attached to the International Anti-Fouling System Certificate

Particulars of ship

Name of ship: . . . .

Distinctive number or letters: . . . .

IMO number: . . . .

Details of anti-fouling system(s) applied

Type(s) of anti-fouling system(s) used . . . .

. . . .

Date(s) of application of anti-fouling system(s) . . . .

Name(s) of company(ies) and facility(ies)/location(s) where applied . . . .

. . . .

Name(s) of anti-fouling system manufacturer(s) . . . .

. . . .

Name(s) and colour(s) of anti-fouling system(s) . . . .

. . . .

Active ingredient(s) and their Chemical Abstracts Service Registry Number(s) (CAS number(s)) . . . .

. . . .

Type(s) of sealer coat, if applicable . . . .

. . . .

Name(s) and colour(s) of sealer coat applied, if applicable . . . .

. . . .

Date of application of sealer coat . . . .

THIS IS TO CERTIFY that this Record is correct in all respects.

Issued at . . . .

(Place of issue of Record)

. . . .

(Date of issue)   *(Signature of authorized official issuing the Record)*

Endorsement of the Records[5]

THIS IS TO CERTIFY that a survey required in accordance with regulation 1(1)(b) of annex 4 to the Convention found that the ship was in compliance with the Convention

Details of anti-fouling system(s) applied

Type(s) of anti-fouling system(s) used . . . . . .

. . . . . .

Date(s) of application of anti-fouling system(s) . . . . . .

Name(s) of company(ies) and facility(ies)/location(s) where applied . . . . . .

. . . . . .

Name(s) of anti-fouling system(s) manufacturer(s) . . . . . .

. . . . . .

Name(s) and colour(s) of anti-fouling system(s) . . . . . .

. . . . . .

Active ingredient(s) and their Chemical Abstracts Service Registry Number(s) (CAS number(s)) . . . . . .

. . . . . .

Type(s) of sealer coat, if applicable . . . . . .

. . . . . .

Name(s) and colour(s) of sealer coat applied, if applicable . . . . . .

. . . . . .

Date of application of sealer coat . . . . . .

Signed: . . . . . .

(Signature of authorized official issuing the Record)

Place: . . . . . .

Date:[6] . . . . . .

(Seal or stamp of the authority)

---

[5] This page of the Record shall be reproduced and added to the Record as considered necessary by the Administration.

[6] Date of completion of the survey on which this endorsement is made.

Appendix 2 to annex 4

MODEL FORM OF DECLARATION ON ANTI-FOULING SYSTEM

DECLARATION ON ANTI-FOULING SYSTEM

Drawn up under the
International Convention on the Control of Harmful Anti-Fouling Systems on Ships

Name of ship . . . .

Distinctive number or letters . . . .

Port of registry . . . .

Length . . . .

Gross tonnage . . . .

IMO number (if applicable) . . . .

I declare that the anti-fouling system used on this ship complies with annex 1 of the Convention.

. . . .

(Date) *(Signature of owner or owner's authorized agent)*

Endorsement of anti-fouling system(s) applied

Type(s) of anti-fouling system(s) used and date(s) of application . . . .

. . . .

. . . .

(Date) *(Signature of owner or owner's authorized agent)*

Type(s) of anti-fouling system(s) used and date(s) of application . . . .

. . . .

. . . .

(Date) *(Signature of owner or owner's authorized agent)*

Type(s) of anti-fouling system(s) used and date(s) of application . . . .

. . . .

. . . .

(Date) *(Signature of owner or owner's authorized agent)*

RESOLUTIONS ADOPTED BY THE CONFERENCE

Resolution 1

Early and effective application of the International Convention on the Control of Harmful Anti-Fouling Systems on Ships

THE CONFERENCE,

HAVING ADOPTED the International Convention on the Control of Harmful Anti-Fouling Systems on Ships,

RECALLING that resolution A.895(21), adopted by the Assembly of the International Maritime Organization on 25 November 1999, *inter alia*, agrees that a legally binding instrument should ensure a global prohibition of the application of organotin compounds which act as biocides in anti-fouling systems on ships by 1 January 2003,

NOTING that article 18 of the Convention provides that it shall enter into force twelve months after the date on which not less than twenty-five States, the combined merchant fleets of which constitute not less than twenty-five per cent of the gross tonnage of the world's merchant shipping, have become Parties to it in accordance with article 17 of the Convention,

NOTING ALSO that annex 1 of the Convention stipulates that organotin compounds which act as biocides in anti-fouling systems shall not be applied or re-applied on ships on or after 1 January 2003,

BEING AWARE that the time remaining until 1 January 2003 may not be sufficient to enable entry into force of the Convention by that date,

DESIRING that the substances addressed by annex 1 of the Convention will cease to be applied on ships as from 1 January 2003,

1. REQUESTS Member States of the Organization to do the utmost to prepare for consent to be bound by the Convention as a matter of urgency;

2. URGES the relevant industries involved to refrain from marketing, sale and application of the substances controlled by annex 1 of the Convention.

Resolution 2

Future work by the Organization pertaining to the International Convention on the Control of Harmful Anti-Fouling Systems on Ships

THE CONFERENCE,

HAVING ADOPTED the International Convention on the Control of Harmful Anti-Fouling Systems on Ships,

NOTING that article 11(1)(b) and (2) and regulation 1(4)(a) of annex 4 of the Convention refer to guidelines to be developed by the Organization for a brief sampling of anti-fouling systems, for thorough inspection and for surveys,

RECOGNIZING the need for the development of these Guidelines in order to ensure global and uniform application of the relevant requirements of the Convention,

INVITES the Organization to develop as a matter of urgency:

(a) guidelines for brief sampling of anti-fouling systems under article 11(1)(b);

(b) guidelines for inspection of ships under article 11(2); and

(c) guidelines for surveys of ships under regulation 1(4)(a) of annex 4,

and adopt them in time before the entry into force of the Convention with a view to facilitating global and uniform implementation of the Convention.

Resolution 3

Approval and test methodologies for anti-fouling systems on ships

THE CONFERENCE,

HAVING ADOPTED the International Convention on the Control of Harmful Anti-Fouling Systems on Ships,

NOTING the procedures set out in the Convention for the addition of controlled anti-fouling systems in annex 1, and the time necessary to consider, adopt, and bring into force such amendments,

MINDFUL OF the precautionary approach set out in Principle 15 of the Rio Declaration on Environment and Development,

RECOGNIZING the importance of preventing the introduction and use of environmentally harmful anti-fouling systems,

1. INVITES States to approve, register or license anti-fouling systems applied in their territories, bearing in mind the information contained in annex 3 of the Convention;

2. ENCOURAGES States to make use of the provisions of article 9(3) of the Convention when considering anti-fouling systems for approval, registration or licensing for use on ships;

3. URGES States to continue the work, in appropriate international fora, for the harmonization of test methods, assessment methodologies, and performance standards for anti-fouling systems containing biocides;

4. REQUESTS the Organization to monitor and, as appropriate, participate in the initiatives described in the above paragraphs.

Resolution 4

Promotion of technical co-operation

THE CONFERENCE,

HAVING ADOPTED the International Convention on the Control of Harmful Anti-Fouling Systems on Ships,

BEING AWARE that the comprehensive protection of the marine environment requires, *inter alia*, broad international co-operation to prevent, reduce and control marine pollution from ships,

RECOGNIZING that Parties to this Convention will be called upon to give full and complete effect to its provisions, in order to reduce or eliminate adverse effects on the marine environment and human health caused by anti-fouling systems on ships,

BEING CONVINCED that the promotion of technical co-operation will expedite the acceptance, uniform implementation and enforcement of this Convention by States,

NOTING WITH APPRECIATION that, through the adoption of resolution A.901 (21), the Assembly of the International Maritime Organization (IMO):

(a) affirmed that IMO's work in developing global maritime standards and in providing technical co-operation for their effective implementation and enforcement, can and does, contribute to sustainable development; and

(b) decided that IMO's mission statement, in relation to technical co-operation, is to help developing countries improve their ability to comply with international rules and standards relating to maritime safety and the prevention and control of marine pollution, giving priority to technical assistance programmes that focus on human resource development, particularly through training and institutional capacity-building,

1. REQUESTS Member States, in co-operation with IMO, other interested States, competent international or regional organizations and industry programmes, to promote and provide directly, or through IMO, support to States that request technical assistance for:

(a) the assessment of the implications of ratifying, accepting, approving, or acceding to, as well as implementing and enforcing this Convention;

(b) the development of national legislation to give effect to this Convention;

(c) the introduction of other measures, including the training of personnel, for the effective implementation and enforcement of this Convention; and

(d) the introduction of environmentally sound measures to collect, handle, treat and dispose of wastes generated in applying or removing anti-fouling systems;

2. REQUESTS ALSO Member States, in co-operation with IMO, other interested States, competent international and regional organizations and industry programmes, to promote co-operation for scientific and technical research on the effects of anti-fouling systems as well as monitoring such effects in particular among Member States which have access to appropriate technology and those which do not;

3. URGES all States to initiate action in connection with the above-mentioned technical co-operation measures without awaiting the entry into force of this Convention.

Resolution MEPC.102(48)

(Adopted on 11 October 2002)

GUIDELINES FOR SURVEY AND CERTIFICATION OF ANTI-FOULING SYSTEMS ON SHIPS

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee conferred upon it by the international conventions for the prevention and control of marine pollution,

RECALLING ALSO that the International Conference on the Control of Harmful Anti-Fouling Systems for Ships, 2001, held in October 2001, adopted the International Convention on the Control of Harmful Anti-Fouling Systems on Ships, 2001 (the AFS Convention) together with four Conference resolutions,

NOTING that Article 10 of the AFS Convention prescribes that ships shall be surveyed and certified in accordance with the regulations of annex 4 of the Convention,

NOTING ALSO that regulation 1(4)(a) of annex 4 of the AFS Convention refers to the guidelines to be developed by the Organization and Conference resolution 2 urges the Organization to develop these Guidelines as a matter of urgency for them to be adopted before the entry into force of the Convention,

HAVING CONSIDERED the draft Guidelines for survey and certification of anti-fouling systems on ships prepared by the Sub-Committee on Flag State Implementation at its tenth session,

1. ADOPTS the Guidelines for survey and certification of anti-fouling systems on ships, as set out in the annex to this resolution;

2. INVITES Governments to apply the Guidelines as soon as possible, or when the Convention becomes applicable to them; and

3. RECOMMENDS that the Guidelines be reviewed on a regular basis.

Annex

Guidelines for survey and certification of anti-fouling systems on ships

1 General

1.1 Article 10 of the International Convention on the Control of Harmful Anti-Fouling Systems on Ships, 2001, hereinafter referred to as "the Convention", prescribes that ships shall be surveyed and certified in accordance with the regulations of annex 4 of the Convention. The purpose of this document is to provide the Guidelines for surveys and certification of anti-fouling systems on ships referred to in Regulation 1(4)(a) of annex 4, hereinafter referred to as the "Guidelines", that will assist Administrations and recognized organizations in the uniform application of the provisions of the Convention and assist companies, shipbuilders, manufacturers of anti-fouling systems, as well as other interested parties to understand the process of the surveys and issuance and endorsement of the certificates.

1.2 These Guidelines provide the procedures for survey to ensure that a ship's anti-fouling system complies with the Convention, and those necessary for issuance and endorsement of an International Anti-Fouling System Certificate. A guidance for compliant anti-fouling systems is given in the appendix to this annex.

1.3 These Guidelines apply to surveys of ships of 400 gross tonnage and above engaged in international voyages, excluding fixed or floating platforms, floating storage units (FSUs), and floating production storage and off-loading units (FPSOs), as specified in regulation 1(1) of annex 4 to the Convention.

1.4 The sole purpose of the survey activities described in these Guidelines is to verify compliance with the provisions of the Convention. Consequently, such surveys do not relate to any aspect not regulated by the Convention even if such aspects relate to the performance of an anti-fouling system on the hull of a ship, including the quality of workmanship during the application process.

1.5 In the event that a new survey method is developed, or in the event that the use of a certain anti-fouling system is prohibited and/or restricted, or in the light of experience gained, these Guidelines may need to be revised in the future.

2 Definitions

For the purposes of these Guidelines:

2.1 "Administration" means the Government of the State under whose authority the ship is operating. With respect to a ship entitled to fly a flag of a State, the Administration is the Government of that State. With respect to fixed or floating platforms engaged in exploration and exploitation of the

sea-bed and subsoil thereof adjacent to the coast over which the coastal State exercises sovereign rights for the purposes of exploration and exploitation of their natural resources, the Administration is the Government of the coastal State concerned.

2.2 "Anti-fouling system" means a coating, paint, surface treatment, surface, or device that is used on a ship to control or prevent attachment of unwanted organisms.

2.3 "Company" means the owner of the ship or any other organization or person such as the manager or the bareboat charterer, who has assumed the responsibility for the operation of the ship from the owner of the ship and who, on assuming such responsibility, has agreed to take over all duties and responsibilities imposed by the International Safety Management (ISM) Code.

2.4 "Gross tonnage" means the gross tonnage calculated in accordance with the tonnage measurement regulations contained in annex 1 to the International Convention on Tonnage Measurement of Ships, 1969, or any successor convention.

2.5 "International voyage" means a voyage by a ship entitled to fly the flag of one State to or from a port, shipyard, or offshore terminal under the jurisdiction of another State.

2.6 "Length" means the length as defined in the International Convention on Load Lines, 1966, as modified by the Protocol of 1988 relating thereto, or any successor convention.

2.7 "Ship" means a vessel of any type whatsoever operating in the marine environment and includes hydrofoil boats, air-cushion vehicles, submersibles, floating craft, fixed or floating platforms, floating storage units (FSUs) and floating production storage and off-loading units (FPSOs).

3 When are surveys required

3.1 An initial survey should be carried out:

.1 for a newbuilding; or

.2 for an existing ship, before the International Anti-Fouling System Certificate required under regulations 2 or 3 of annex 4 to the Convention is issued for the first time.

3.2 In order to ease the burden on the companies and other parties, the initial survey of the anti-fouling system on existing ships may best be carried out in connection with a drydock survey.

3.3 A survey should be carried out whenever an anti-fouling system is changed or replaced. Such surveys should cover the same scope as in section 5.2.

3.4 A major conversion affecting the anti-fouling system of a ship may be considered as a newbuilding as determined by the Administration.

3.5 Repairs generally do not require a survey. However, repairs affecting approximately twenty-five (25) percent or more of the anti-fouling system, should be considered as a change or replacement of the anti-fouling system.

3.6 A non-compliant anti-fouling system controlled under annex 1 of the Convention, that undergoes repair must be repaired, or replaced with a compliant anti-fouling system.

4 Request for survey

4.1 Prior to any survey, a request for survey should be submitted by the company to the Administration, or to a recognized organization, along with the ship's data required in the International Anti-Fouling System Certificate as listed:

.1 Name of ship

.2 Distinctive number or letters

.3 Port of registry

.4 Gross tonnage

.5 IMO Number.

4.2 A request for survey should be supplemented by a declaration and supporting information from the anti-fouling system manufacturer, confirming that the anti-fouling system applied, or intended to be applied, to the ship is in compliance with the requirements of the Convention (with an identification of the version of the Convention referred to). Such declaration should provide the following information contained in the Record of Anti-Fouling Systems, as can be found in appendix 1 to annex 4 of the Convention:

.1 Type of anti-fouling system*

.2 Name of anti-fouling system manufacturer

.3 Name and colour of anti-fouling system

.4 Active ingredient(s) and their Chemical Abstracts Service Registry Number(s) (CAS number(s)).

Information required by the surveyor regarding compliance of product with the Convention should be found in a declaration from the anti-fouling system manufacturer which may be provided on the anti-fouling system container and/or on supportive documentation (such as Material Safety Data Sheets (MSDSs), or similar). A link between the supportive documentation and the relevant container should exist.

5 Conduct of surveys

5.1 *Surveys for newbuildings*

.1 As part of the survey, it should be verified that the anti-fouling system specified by the documentation submitted with the

---

* Examples of suitable wording could be: "Organotin-free self-polishing type", "Organotin-free ablative type", "Organotin-free conventional", "Biocide-free silicon type paint, others". In the case of an anti-fouling system containing no active ingredients, the words "biocide-free" should be used.

request for survey complies with the Convention. The survey should include verification that the anti-fouling system applied is identical to the system specified in the request for survey.

.2 Taking into account experience gained and the prevailing circumstances, the verification required by paragraph 5.1.1 should include one or more of the following tasks, as deemed necessary to verify compliance:

(a) Checking that the product identification on anti-fouling system containers used during the application process is identical to the system specified in the request for survey.

(b) Sampling of the anti-fouling system.

(c) Testing of the anti-fouling system.

(d) Other checks conducted on site.

.3 The verification tasks set out in paragraph 5.1.2 should be conducted at any time, either before, during, or after the anti-fouling system has been applied to the ship, as deemed necessary to verify compliance. No checks or tests must affect the integrity, structure or operation of the anti-fouling system.

5.2 *Surveys of existing ships intending to apply a new anti-fouling system*

.1 If the existing anti-fouling system is confirmed by an International Anti-Fouling System Certificate not to be controlled under annex 1 of the Convention, the provisions described in paragraph 5.1 apply.

.2 If the existing anti-fouling system is declared not to be controlled under annex 1 of the Convention, without being documented by an International Anti-Fouling System Certificate, a verification should be carried out to confirm that the anti-fouling system complies with the requirements of the Convention. This verification may be based on sampling and/or testing and/or reliable documentation, as deemed necessary based on experience gained and the existing circumstances. Documentation for verification could, e.g., be MSDSs or similar, a declaration of compliance from the anti-fouling system manufacturer, invoices from the shipyard and/or the anti-fouling system manufacturer. To verify the new anti-fouling system, the provisions described in paragraph 5.1 apply.

.3 If the existing anti-fouling system has been removed, the removal should be verified in addition to the provisions described in paragraph 5.1.

.4 If a sealer coat has been applied, a verification should be carried out to confirm that the name, type and colour of the sealer coat applied to the ship match those specified in the request for survey, and that the existing anti-fouling system has been covered with that sealer coat. Additionally the provisions described in paragraph 5.1 apply.

.5 If the existing anti-fouling system is controlled under annex 1 of the Convention, it should be removed according to subparagraph 5.2.3 or covered by a sealer coat according to subparagraph 5.2.4 not later than 1 January 2008. Prior to this date, the existing anti-

fouling system may be overcoated with an anti-fouling system not controlled under annex 1 without removing or sealing the existing anti-fouling system. This option should be stated on the International Anti-Fouling System Certificate by ticking off the appropriate box. To verify the new anti-fouling system, the provisions described in paragraph 5.1 apply.

5.3 *Surveys of existing ships requesting only an International Anti-Fouling System Certificate*

.1 If the existing anti-fouling system is declared to be controlled under annex 1 of the Convention (i.e. containing prohibited/regulated compounds), an International Anti-Fouling System Certificate may be issued on request stating that the anti-fouling system will be removed, or covered with a sealer coat when directed by the Convention.

.2 If the existing anti-fouling system is declared not to be controlled under annex 1 of the Convention, a verification should be carried out to confirm that the anti-fouling system complies with the requirements of the Convention. This verification may be based on sampling and/or testing and/or reliable documentation, as deemed necessary based on experience gained and the existing circumstances. Such documentation could be MSDSs or similar, a declaration of compliance from the anti-fouling system manufacturer, invoices from the shipyard and/or the anti-fouling system manufacturer. If this information raises no reasonable doubt that the system applied is compliant with annex 1 of the Convention, the International Anti-Fouling System Certificate may be issued on this basis.

5.4 *Surveys of ships prior to entry into force of the Convention*

.1 Prior to the Convention having entered into force, an Administration may conduct surveys of ships in accordance with these Guidelines, and may then issue a Statement of Compliance to this effect.

.2 Ships capable of documenting full compliance with the Convention through such a statement of compliance may be issued, upon entry into force of the Convention, an International Anti-Fouling System Certificate on that basis subject to any additional requirements from the Administration.

6 Issuing or endorsing the International Anti-Fouling System Certificate

6.1 The International Anti-Fouling System Certificate along with the Record of Anti-Fouling Systems should be:

.1 issued upon satisfactory completion of the initial survey;

.2 issued upon acceptance of another Party's International Anti-Fouling System Certificate; or

.3 endorsed upon satisfactory completion of a survey for change or replacement of an anti-fouling system.

Appendix

Guidance for compliant anti-fouling systems

For the purpose of compliance with annex 1 of the Convention, small quantities of organotin compounds acting as a chemical catalyst (such as mono- and di-substituted organotin compounds) are allowed, provided that they are present at a level which does not provide a biocidal effect to the coating. On a practical level, when used as a catalyst, an organotin compound should not be present above 2,500 mg total tin per kilogram of dry paint.

Resolution MEPC.104(49)
Adopted on 18 July 2003

GUIDELINES FOR BRIEF SAMPLING OF ANTI-FOULING SYSTEMS ON SHIPS

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee conferred upon it by the international conventions for the prevention and control of marine pollution,

RECALLING ALSO that the International Conference on the Control of Harmful Anti-fouling Systems for Ships, 2001, held in October 2001, adopted the International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001 (the AFS Convention) together with four Conference resolutions,

NOTING that article 11(1) of the AFS Convention prescribes that ships to which this Convention applies may, in any port, shipyard, or offshore terminal of a Party, be inspected by officers authorized by that Party for the purpose of determining whether the ship is in compliance with this Convention, and that such inspection includes brief sampling of the ship's anti-fouling system,

NOTING ALSO that article 11(1) of the AFS Convention refers to the guidelines to be developed by the Organization and Conference resolution 2 urges the Organization to develop these guidelines as a matter of urgency for them to be adopted before the entry into force of the Convention,

NOTING FURTHER that through resolutions MEPC.102(48) and MEPC.105(49) the Organization has developed "Guidelines for Survey and Certification of Anti-fouling Systems on Ships and "Guidelines for Inspection of Anti-fouling Systems on Ships, respectively, and

HAVING CONSIDERED the recommendation made by the Sub-Committee on Flag State Implementation at its eleventh session,

1. ADOPTS the Guidelines for brief sampling of anti-fouling systems on ships, the text of which is set out in the annex to this resolution;

2. INVITES Governments to apply the Guidelines as soon as possible, or when the Convention becomes applicable to them; and

3. RECOMMENDS that the Guidelines be reviewed on a regular basis.

Annex

Guidelines for brief sampling of anti-fouling systems on ships

Table of contents

1 General

Purpose

1.1 Article 11 of the International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001, hereinafter referred to as "the Convention", and resolution MEPC.1[2(48) Guidelines for survey and certification of anti-fouling systems on ships refer to sampling as a method of verification of compliance of a ships anti fouling system with the Convention for inspection and survey.

1.2 The "Guidelines for brief sampling of anti-fouling systems on ships", hereinafter referred to as "the Guidelines", provide procedures for sampling to support the effectiveness of survey and inspection to ensure that a ship's anti-fouling system complies with the Convention and thus assists:

.1 Administrations and recognized organizations (ROs) in the uniform application of the provisions of the Convention;

.2 port State control officers with guidance on methods and handling of brief sampling in accordance with Article 11(1)(b) of the Convention; and

.3 companies, shipbuilders, manufacturers of anti-fouling systems, as well as any other interested parties in understanding the process of sampling as required in terms of the Convention.

1.3 However, inspections or surveys do not necessarily always need to include sampling of anti-fouling system.

1.4 These Guidelines apply to surveys and inspections of ships subject to the Convention.

1.5 The sole purpose of the sampling activities described in the Guidelines is to verify compliance with the provisions of the Convention. Consequently, such activities do not relate to any aspect not regulated by the Convention, (even if such aspects relate to the performance of an anti-fouling system on the hull of a ship, including the quality of workmanship).

Structure of these Guidelines

1.6 These Guidelines contain:

.1 a main body covering aspects of general nature common to "sampling" procedures related to the regulation of anti-fouling systems controlled by the Convention; and

.2 appendices describing the unique procedures associated with the sampling and analysis of anti-fouling systems controlled by the Convention. These appendices only serve as examples of sampling and analytical methods and other sampling methods not described in an appendix may be used subject to the satisfaction of the Administration or the port State, as appropriate.

1.7 For reasons including the event of other anti-fouling systems becoming controlled under the Convention, or in the light of new experience acquired, these Guidelines may need to be reviewed or amended in the future.

2 Definitions

For the purposes of these Guidelines:

2.1 *Administration* means the Government of the State under whose authority the ship is operating. With respect to a ship entitled to fly a flag of a State, the Administration is the Government of that State. With respect to fixed or floating platforms engaged in exploration and exploitation of the sea-bed and subsoil thereof adjacent to the coast over which the coastal State exercises sovereign rights for the purposes of exploration and exploitation of their natural resources, the Administration is the Government of the coastal State concerned.

2.2 *Anti-fouling system* means a coating, paint, surface treatment, surface or device that is used on a ship in order to control or prevent attachment of unwanted organisms.

2.3 *Threshold value* means the concentration limit of the chemical under investigation below which compliance with the relevant provisions of the Convention may be assumed.

2.4 *Company* means the owner of the ship or any other organization or person such as the manager or the bareboat charterer, who has assumed the responsibility for the operation of the ship from the owner of the ship and who, on assuming such responsibility, has agreed to take over all duties and responsibilities imposed by the International Safety Management (ISM) Code.

2.5 *Length* means the length as defined in the International Convention on Load Lines, 1966, as modified by the Protocol of 1988 relating thereto, or any successor Convention.

2.6 *Tolerance range* means the numerical range added to the threshold value indicating the range where detected concentrations above the threshold value are acceptable due to recognised analytical inaccuracy and thus do not compromise the assumption of compliance.

3 Personnel safety when sampling

Health

3.1 Persons carrying out sampling should be aware that solvents or other materials used for sampling may be harmful. Wet paint which is sampled may also be harmful. In these cases the material safety data sheet (MSDS) for the solvent or paint should be read and appropriate precautions should be taken. This will normally include the wearing of long sleeve solvent resistant gloves of suitable impervious material – e.g. nitrile rubber.

3.2 Quantities of dry anti-fouling paint removed during sampling from ships' hulls will normally be too small to cause significant health effects.

Safety

3.3 Access to ships to carry out sampling safely may be difficult. If a ship is moored alongside persons carrying out sampling must ensure they have safe access to reach the hull from e.g. platforms, crane baskets, cherry-pickers, gangways. They must ensure that they are protected by railings or a climbing harness or take other precautions so that they cannot fall into the water between the quay and the ship. If in doubt a lifejacket and possibly a safety line, should be worn when sampling.

3.4 Access to ships in dry-dock should be made by secure means. Scaffolding should be securely constructed and cherry-pickers or dock-arms should be properly constructed and maintained if they are to be used to gain access. There should be a system to record the presence of the inspector in the dock area, and he should preferably be accompanied. Safety harnesses should be worn in cherry-picker baskets, if used.

4 Sampling and analysis

Sampling methods

4.1 During sampling, care should be taken not to affect the integrity or operation of the anti-fouling system.

4.2 Sampling where the anti-fouling coating is visibly damaged* or on block mark areas on the flat bottom of the ship (where the intact anti-fouling system is not applied) should be avoided. Sampling adjacent to or below areas where the anti-fouling system is damaged should also be avoided. When a sample point on the hull has been selected, any fouling present should be removed with water and a soft sponge/cloth before taking a specimen of the anti-fouling system (to avoid contamination of sample). Where possible, if carried out in dry-dock, sampling should be carried out after the hull has been water-washed.

4.3 The materials required for brief sampling methodologies should ideally be inexpensive, widely available and therefore readily accessible, irrespective of sampling conditions and/or location.

4.4 The sampling procedure should ideally be easily and reliably undertaken. Persons conducting sampling should receive appropriate training in sampling methods.

Technical aspects

4.5 The sampling method should take into account the type of anti-fouling system used on the ship.

4.6 Specimens of paint for analysis during survey and certification can be taken either as wet paint† from product containers, or dry paint film sampled from the hull.

Sampling strategy and number of samples

4.7 The sampling strategy is dependent on the precision of the sampling method, the analytical requirements, costs and required time and the purpose of the sampling. The number of paint specimens taken of each sample should allow for a retention quantity for back-up/storage in the event

---

* During in-service periods, anti-fouling coatings on ships' hulls often become damaged. The extent of the damage varies between ships and damaged areas can be visually recognized. Typically damage can be restricted to localized areas e.g. anchor chain damage (bow region), fender damage (vertical sides of hull), 'rust through areas' (underlying rust causing coating failure) or in some cases be in smaller areas scattered over larger areas of the hull (usually older ships where over-coating of original system has taken place many times).

† In order to prevent contamination, wet paint samples should be taken from a newly opened container. Paint should be stirred to ensure even consistency before sampling and all equipment used should be cleaned prior to use. Liquid paint samples should be stored in appropriate sealed packaging which will not react with or contaminate the sample. In the case of multi-component coatings (where on-site mixing of several components is required prior to application), samples of each component should be taken and the required mixing ratio recorded. When a sample of wet paint is taken from a container, details of the paint should be recorded e.g. details required for the IAFS Certificate along with a batch number for the product.

of a dispute. For dry samples, triplicate specimens of paint at each sampling point should be taken in close proximity to each other on the hull (e.g. within 10 cm of each other).

4.8 In cases where it is recognized that more than one type of anti-fouling system is present on the hull, where access can be gained, samples should be taken from each type of system:

.1 for survey purposes or for more thorough inspections pursuant to article 11(2) of the Convention, in order to verify the compliance of an anti-fouling system, the number of sample points should reflect representative areas of the ship's hull; and

.2 for inspection purposes pursuant to article 11(1) of the Convention sample points on the hull should be selected covering representative areas where the anti-fouling system is intact. Depending on the size of the vessel and accessibility to the hull, at least four sample points should be equally spaced down the length of the hull. If sampling is undertaken in dry-dock, flat bottom areas of the hull should be sampled in addition to vertical sides as different anti-fouling systems can be present on these different areas.

Analysis

4.9 The analysis of the anti-fouling system should ideally involve minimal analytical effort and economic cost.

4.10 The analysis should be conducted by a recognized laboratory meeting the ISO 17025 standard or another appropriate facility at the discretion of the Administration or the port State.

4.11 The analytical process should be expeditious, such that results are rapidly communicated to the officers authorized to enforce the Convention.

4.12 The analysis should produce unambiguous results expressed in units consistent with the Convention and its associated Guidelines. For example, for organotin, results should be expressed as: mg tin (Sn) per kg of dry paint.

Note: Compound-specific sampling and analytical methodologies are described in the appendices to these Guidelines.

5 Thresholds and tolerance limits

Thresholds

5.1 The analysis should be quantitative to the point of being able to accurately verify the threshold limits within the given tolerance.

5.2 In cases where compliance with acceptable limits, or lack thereof, is unclear, additional sampling or other methodologies for sampling should be considered.

Tolerance range

5.3 Statistical reliability for each (compound-specific) brief sampling procedure should be documented. The analysis should be quantitative to

the point of being able to accurately verify the threshold limits within the given tolerance. On the basis of these data a compound-specific tolerance range should be derived and stated compound-specific in the method description. In general, the tolerance range should not be higher than the standard deviation under typical conditions for testing and should under no circumstances go beyond 30 %.

6 Definition of compliance

6.1 Compliance with Annex 1 of the Convention is assumed if the anti-fouling system contains organotin at a level which does not provide a biocidal effct . In practice organotin compounds should not be present above 2,500 mg organotin (measured as Sn) per kg of dry paint.

6.2 Compliance is largely dependent on the results of sampling and subsequent analysis. As every method of sampling and analysis has its specific accuracy, a compound-specific tolerance level may be applied in borderline cases with concentrations very close to the threshold level.

6.3 In general, compliance is assumed when the samples yield results below the threshold value.

7 Documentation and recording of information

7.1 The results of the sampling procedure should be fully documented on a method-specific record sheet. Examples are provided in the appendices to these Guidelines.

7.2 Such record sheets should be completed by the sampler and should be submitted to the competent authority of the Port State or Administration.

Appendix

Possible methods for brief sampling and analysis of anti-fouling systems on ships

– Organotin –

METHOD 1

1 Purpose of this method concerning brief sampling and analysis of anti-fouling systems

1.1 This method has been developed in order to describe a rapid methodology appropriate for the identification of anti-fouling systems on ship hulls containing organotin compounds acting as biocide. This method has been designed such that sealers should not be affected, and any underlying anti-fouling agent (or primer) is not taken up in the sampling procedure. The method is not recommended for silicon-based anti-fouling systems.

1.2 This method is based on a two-step analysis. The first step detects total tin as an indicator for organotin; the second step, detecting specific organotin compounds, is only necessary in the case of the first step proving positive.

2 Sampling device and materials

2.1 The sampling device is constructed in a way that only the upper layer of paint is removed, thereby and should leave any underlying paint (sealer, primer etc.) intact. This result is achieved through the use of a moving disk, (eccentric rotation) which is covered by an abrasive material like quartz or glass fibre fabric. This abrasive material has to be suitable for its use as a supporting material for the removed paint.

2.2 The device fulfils the following requirements:

.1 the device has to work independently from any stationary power supply. The device may be driven by an electrical motor (battery-driven) or may be mechanically driven by a clockwork-like spring, provided it is able to sustain the movement over the required time period;

.2 the applied force has to be constant during the operation, and the area for paint removal has to be defined;

.3 the abrasive material has to be inert against chemical solvents and acids and must not contain more than trace amounts of tin or tin compounds; and

.4 the amount of paint removed after a regular operation of the device has to be shown to exceed 20 mg per sample.

2.3 The device as described in the following section has been shown to be suitable for the brief sampling procedure. Any other device may be used however, provided such a device has proven to meet all the above-mentioned requirements.

2.4 The sampling device described here consists of a polyethylene disk, on which fibre glass fabric can be mounted by the use of an O-ring. The disk is moved on an eccentrically rotating axis.

3 Sampling procedure

3.1 The sampling procedure should be performed in the following manner:

.1 control samples should be taken through the entire sampling and analytical process to account for possible contamination;

.2 the mass of the fibre glass pads is weighed with a precision of at least 1 mg. The weight should be documented for each sample;

.3 the fabric should be moistened thoroughly with isopropanol (0.7ml per sample) immediately before sampling;

.4 when a sample point on the hull has been selected, any fouling present should be removed with water and a soft sponge/cloth before taking a specimen of the anti-fouling system (to avoid contamination of sample). Where possible, if carried out in dry-dock, sampling should be carried out after the hull has been water-washed;

.5 the sampling device is then held against the surface to be sampled for a period of 5 seconds, prior to the sampling device being switched on;

.6 the sampling device is switched on, thereby removing paint by the circular motion of the fibre glass fabric against the surface of the ship;

.7 the sampling device should be applied to the surface of the hull for a suitable period of time, such that at least 20 mg of paint is taken up by the pad. As a general rule, if the pad colour after sampling matches the colour of the hull coating a sufficient sample has been taken;

.8 the two-step analysis procedure requires that every sample should be taken in triplicate. Two of the specimens should be labelled Specimen 'A' and Specimen 'B'. In addition a third specimen for storage/back-up should be taken. These specimens should be taken as close to each other as possible, but without overlap; and

.9 upon completion of the sampling, the fibre glass fabric pads should be left to dry, and re-weighed.

3.2 Samples should be stored in appropriate sealed packaging, which will not react with or contaminate the sample.

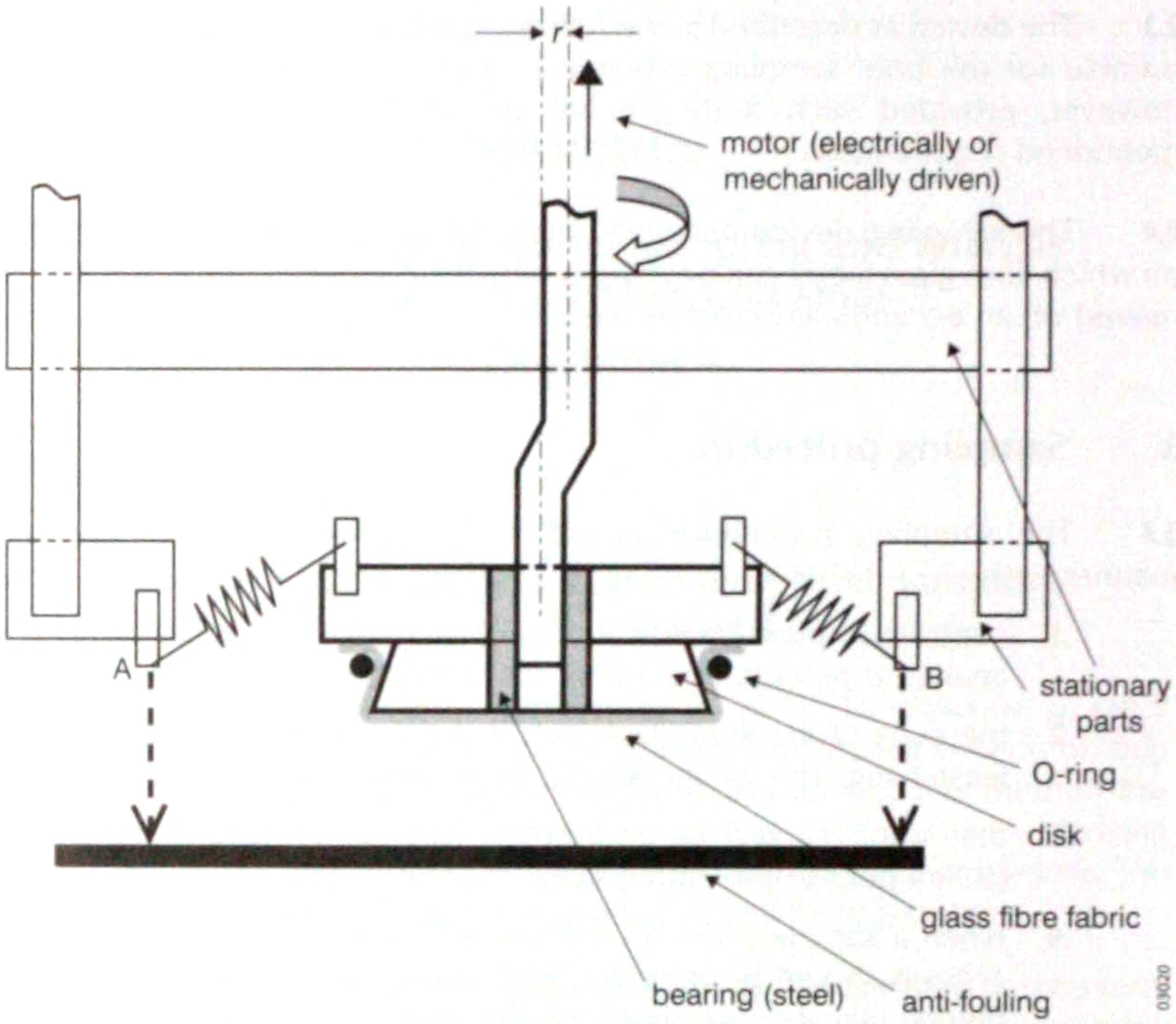


Diagram A – *Schematic cross section of the sampling device*

The indicated points A and B are to be pressed against the surface. The polyethylene disk, covered with the glass fibre fabric, is moved with an amplitude of $2r$ (r = 1.0 cm) on the surface.

Specific data:

Force applied on the paint surface:	25 N (Newton)
Effective diameter of the disk:	5 cm
Frequency of rotation:	6 rotations/s
Solvent used	isopropanol (0.8 m*l* per sample).

4 Sampling strategy

4.1 Sampling should be conducted in accordance with paragraph 4 of the Guidelines.

4.2 For inspection purposes in most cases accessibility to all parts of the hull will not be given. A minimum number of eight independent samples should be taken from different accessible parts of the hull.

5 Analytical procedure

5.1 The two components comprising the analytical procedure are illustrated in the flow diagram B. The two components, or steps, are as follows:

.1 (Step 1) – An analysis of Specimen A for the presence of total tin; and

.2 (Step 2) – A more cost- and time-consuming analysis of Specimen B, that is applied only when Step 1 produces positive results. This test involves organotin analysis by gas chromatography/mass spectrophotometry (GC/MS) after derivatisation and provides specific data on the respective organotin species.

Step 1: Investigation of total tin content in Specimen 'A'

Analysis of Specimen 'A'

5.2 Specimen 'A' is analysed for mass of total tin per kilogram of dry paint (or mass of tin per sample) by applying inductively coupled plasma/mass spectrometry (ICP/MS), once the material had been solubilized by digestion using aqua regia. It should be noted that any other scientifically recognized procedure for tin analysis (such as AAS, XRF and ICP-OES) is acceptable.

Step 2: Characterization of organotin in Specimen 'B'

Analysis of Specimen 'B'

5.3 Should Specimen 'A' produce positive results, organotin compounds should be identified and quantified in Specimen 'B'. Specimen 'B' may be analysed using the following procedure:

.1 solvent extraction of Specimen 'B' as supported by sonication in an ultrasonic bath;

.2 derivatisation with ethylmagnesium bromide;

.3 clean-up of the extract;

.4 analysis using high resolution gas chromatography/mass spectrophotometry (GC/MS); and

.5 quantifications using tripropyltin as a standard.

5.5 Any equally reliable method for the chemical identification and quantification of organotin compounds is acceptable.

6 Threshold and tolerance range

6.1 The threshold value for the brief sampling method as described here is:

"2,500 mg tin (Sn) per kg of dry paint."

Tolerance range

6.2 The tolerance range is 500 mg Sn/kg of dry paint (20%) in addition to the threshold value.

Organotin containing compounds acting as biocides or catalysts

6.3 As stated in the appendix of resolution MEPC.102(48), for the purposes of defining compliance with annex 1 of the Convention, it should be noted that small quantities of organotin compounds, acting as chemical catalysts (such as mono- and di-substituted organotin compounds) are allowed, provided they are not acting as a biocide.

6.4 Inorganic impurities in the constituents of the paints should be considered.

6.5 At present neither organotin catalysts nor inorganic impurities are found at concentrations which will be close to the threshold level (2,500 mg Sn/kg of dry paint) or higher. However, organotin-containing compounds, when present in paint in order to act as a biocide, were found in concentrations up to 50,000 mg Sn/kg of dry paint. Thus the discrimination between anti-fouling systems containing organotin compounds acting as a biocide and anti-fouling systems not containing these compounds or not containing these compounds at concentrations where they act as a biocide, is reliably possible.

7 Definition of compliance

Two-step procedure

7.1 The analytical verification of the compliance with the Convention is performed in a two-step procedure according to the flow-diagram (diagram B).

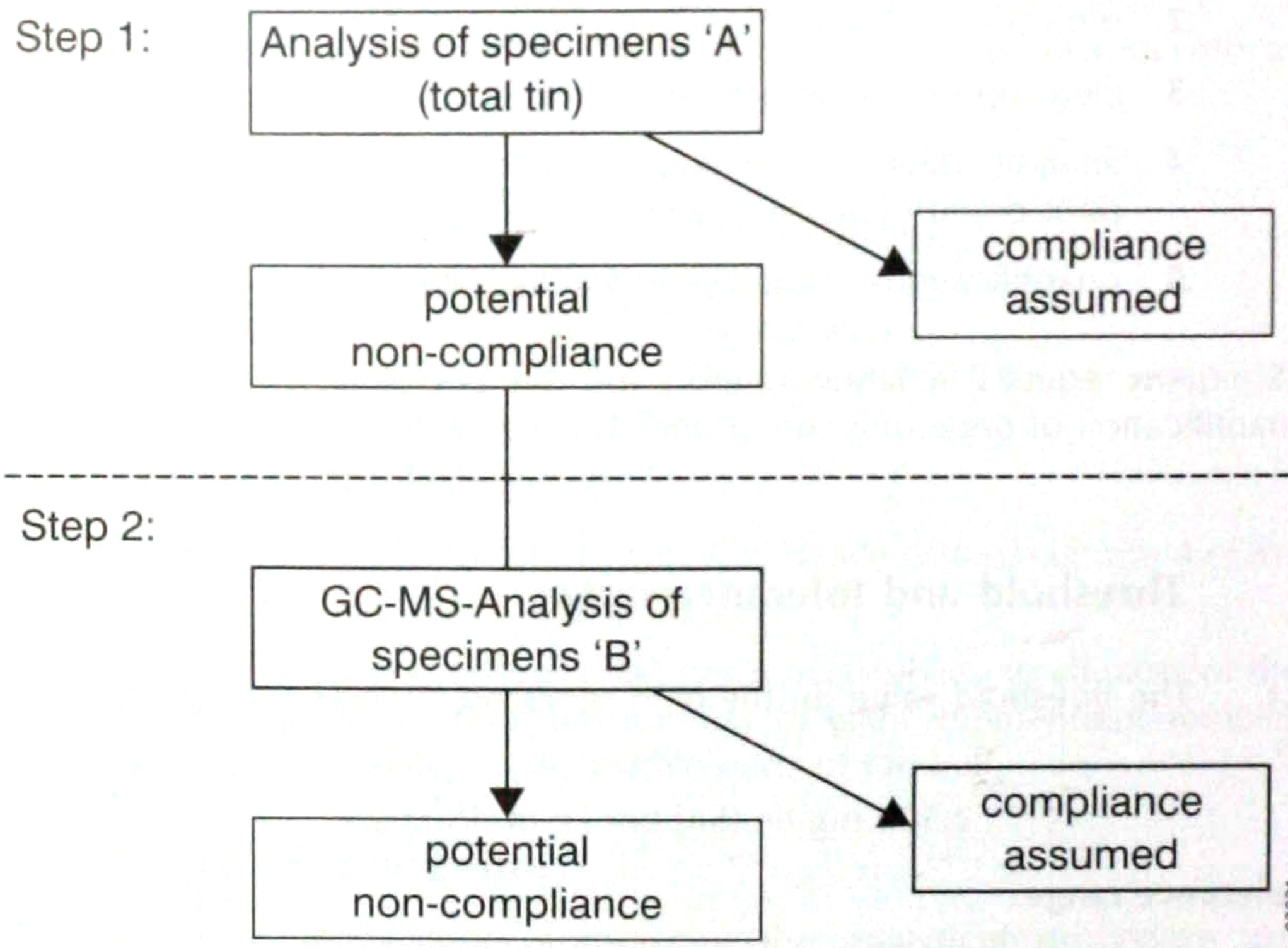


Diagram B – *Flow diagram illustrating the two-step analysis procedure*

Compliance with the criteria at the 'Step 1-level'

7.2 Compliance with the Convention is assumed when the results from the specimens 'A', analysed in step 1, meet the following:

.1 no more than 25% of the total number of samples yield results above 2,500 milligrams total tin per kilogram dry paint (2,500 mg Sn/kg of dry paint); and

.2 no sample of the total number of at least eight samples shows a concentration of total tin higher than the sum of threshold value plus the tolerance range, i.e. no sample must exceed the concentration 3,000 mg Sn/kg of dry paint.

7.3 If the results in specimen 'A' indicate that no organotin acting as biocide is present, then performing step 2 is not necessary.

Non-compliance with the criteria at the 'Step 1-level'

7.4 A positive result (non-compliance) is indicated if provisions of paragraph 7.2 are not met.

7.5 A positive result at step 1 (specimen 'A') would indicate that step 2 should be undertaken, and those samples labelled specimen 'B' should be analysed in order to determine and characterize the organotin present (see diagram B).

Compliance with the criteria at the 'Step 2-level'

7.6 Compliance with the Convention is assumed when the results from the specimens 'B', analysed in step 2, meet the following requirements at the same time:

.1 no more than 25% of the total number of samples yield results above 2,500 milligrams total tin per kilogram dry paint (2,500 mg Sn/kg of dry paint); and

.2 no sample of the total number of at least eight samples shows a concentration of total tin higher than the sum of threshold value plus the tolerance range, i.e., no sample must exceed the concentration 3,000 mg Sn/kg of dry paint.

Non-compliance at 'Step 2-level'

7.7 A positive result in step 2 indicates non-compliance if the provisions of paragraph 7.6 are not met. Such results should be interpreted to mean that organotin compounds are present in the anti-fouling system at a level at which it would act as a biocide.

Appendix to method 1

Record sheet for the brief sampling procedure for compliance with the Convention in terms of the presence of organotin acting as a biocide in anti-fouling systems on ship hulls

Record sheet **GUIDELINES FOR BRIEF SAMPLING OF ANTI-FOULING SYSTEMS ON SHIPS – ORGANOTIN –**		Record number
SECTION A: Administration		
1 Country	2 Name of port	3 Date
4 Reason for sampling: ☐ Port State control ☐ Survey & Certification ☐ Other flag State compliance inspection		
5 Company details: 1 Name of ship: 2 Distinctive number or letters: 3 Port of registry: 4 Gross tonnage: 5 IMO number:		6 Inspecting official's details: 1 Name: 2 Comments:
SECTION B: Sampling		
1 Time sampling procedure initiated:		
2 Description of location from where samples were taken (frame number and distance from boot topping, refer to paragraph 3.2):		
3 Number of samples taken (three specimens per sample):		
4 Photographs taken of the sample points prior to sampling? ☐ Yes ☐ No		
5 Time sampling procedure completed:		
6 Additional comments concerning sampling procedure:		

SECTION C: Analysis and results

1 Step 1 total tin analysis:

Company name:

Analyst responsible: Date :

2 Specimen 'A' results: _____ total number of specimens 'A' analysed: _____

No.	mg Sn/kg	No.	mg Sn/kg	No.	mg Sn/kg	No.	mg Sn/kg
1		5		9		13	
2		6		10		14	
3		7		11		15	
4		8		12		16	

Number of specimens exceeding 2,500 mg/kg: _____

1 or more specimens exceeding 3,000 mg/kg: yes ☐ no ☐

Conclusion: Step 2 required ☐
Compliance, Further analysis unnecessary: ☐

3 Additional comments concerning analysis of results from Specimen 'A':

4 Organotin analysis undertaken by:

Company name:

Analyst responsible: Date :

5 Specimen 'B' results: _____ total number of specimens 'B' analysed: _____

No.	organotin (mg/kg) as Sn	No.	organotin (mg/kg) as Sn	No.	organotin (mg/kg) as Sn	No.	organotin (mg/kg) as Sn
1		5		9		13	
2		6		10		14	
3		7		11		15	
4		8		12		16	

Number of specimens exceeding 2,500 mg/kg: _____

1 or more specimens exceeding 3,000 mg/kg: yes ☐ no ☐

Conclusion: Non-compliance assumed ☐
Compliance assumed ☐

6 Additional comments concerning analysis of results from Specimens 'B':

7 Summarized conclusion:

Compliance assumed ☐

Non-compliance assumed ☐

THIS IS TO CERTIFY that this Record is correct in all respects.

Issued at .....
(Place of issue of Record)

.....
(Date of issue) (Printed name and signature of authorized official issuing the Record)

(Seal or stamp of the authority /organization)

METHOD 2

1 Purpose of this method

1.1 This method provides sampling and analysis procedures to identify the presence of organotin compounds in the anti-fouling systems on ships. The method is designed such that the sampling and the first stage analysis could be carried out by ship surveyors or port State control officers (PSCOs) on the survey/inspection site, e.g. at a dry dock.

1.2 This method is based on a two-stage analysis. The first stage detects total tin as an indicator for the presence of organotin and the second stage is necessary only in the case that the first stage analysis providing a positive result to detect specific organotin compounds.

2 Sampling

2.1 The sampling is carried out by using abrasive paper rubbing on the surface of the anti-fouling system. This results in collection of paint fragment of the anti-fouling system from thin area, less than several micrometer in depth from the surface, which do not affect the coatings lying underneath such as sealers.

2.2 Abrasive paper is pasted on a disc of approximately 10 mm in diameter. Rubbing the surface of the anti-fouling system with the disc collects several milligrams of the sample on to the abrasive paper.

2.3 The sampling device consists of an electric motor, two (or three) rotating rods on each of which a disc is attached, and a battery for electric power supply. The discs are pressed on to the surface of ship's hull by spring coils. The disks rotate counter-clockwise while the rods turn clockwise around the centre of the device. Schematic diagram is illustrated in figure 1.

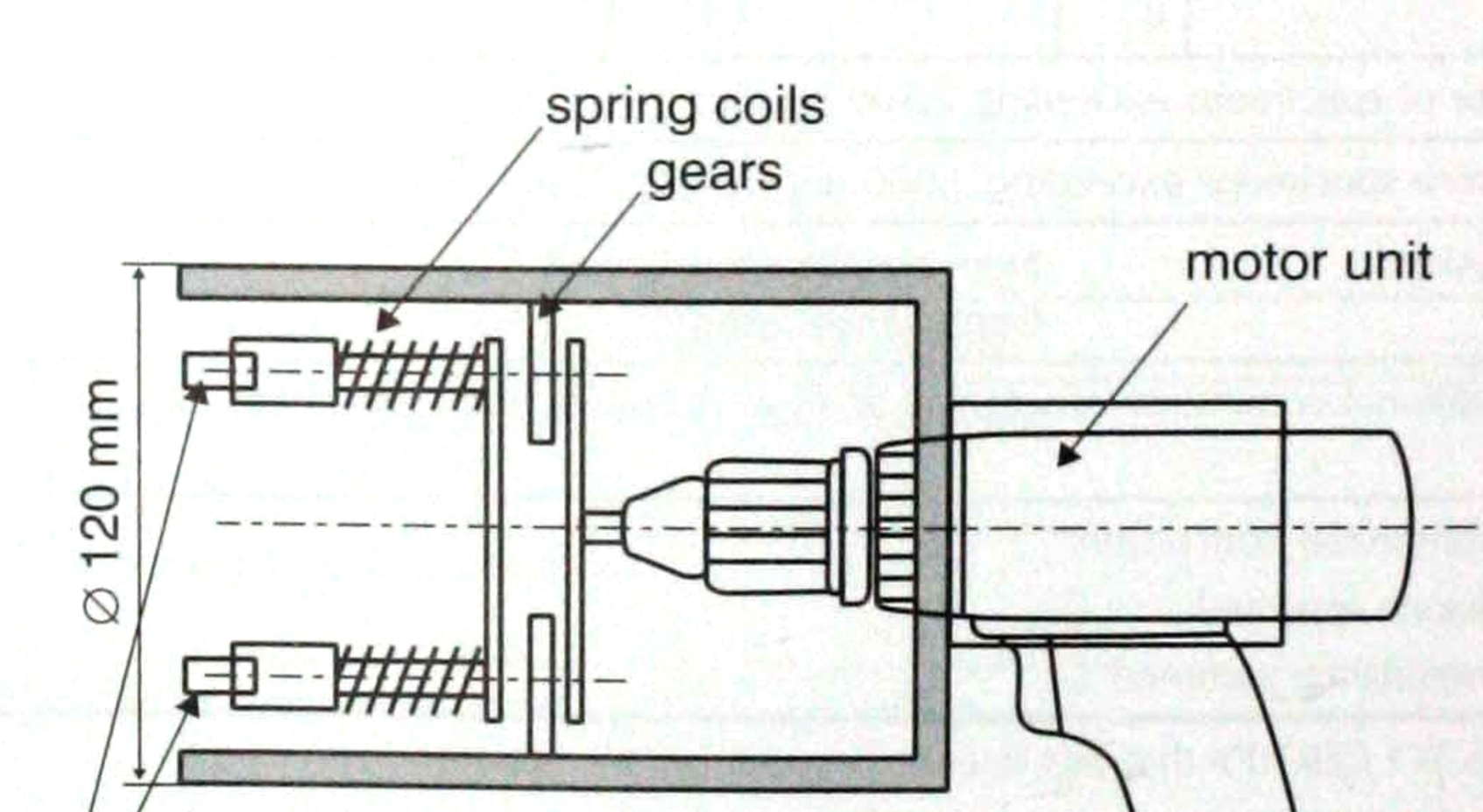


Figure 1 – *Schematic diagram of sampling device*

2.4 Sampling point is selected such that the anti-fouling system is intact over an area of approximately 50 cm × 50 cm or more. At each sampling point, three sets of sampling, or more if necessary, should be carried out to obtain at least six specimens.

2.5 The device is pressed on the ship's hull where it is appropriate to be sampled and held by hand. The electric motor is switched on to slide along the painted surface to lightly scrape off the fragments of the paint onto the abrasive paper. After the sample collection, each disc is removed from the device and stored in an inert container.

2.6 Sampling should normally be carried out with the sampling device. However, in the case that accessibility to the sampling point is poor, it is acceptable to collect samples with the discs by hand if necessary.

3 The first-stage analysis

3.1 The first-stage analysis is assumed to be carried out on the spot of the survey or inspection, e.g. dry docks and sea ports. In order to accomplish the on-site analysis, X-ray fluorescence analysis (XRF) is used in this method to detect total tin content.

3.2 Analytical characteristics, such as detection limit and accuracy, are highly dependent on the type of the instrument, i.e. type of X-ray tube, spectrometer, optical arrangement (filters or collimators), etc. Among several types of the XRF instruments, an energy-dispersive spectrometer with a silicon drift detector (SDD), which is compact in size and be able to be operated without liquid nitrogen, is preferable to the present analytical system for a field use, whereas wave-length dispersion system or solid-state detector are also available if the analysis carried out at laboratories.

3.3 Software customized for the tin analysis is prepared to assist the operator, who is assumed to be a ship surveyor or PSCO, to detect total tin in the specimens.

3.4 The customized software may in advance need a calibration curve of the characteristic X-ray intensity of tin in relation to the tin content particularly in the range of 0.1 to 0.5%.

3.5 After the preparation including the warming-up of the XRF instrument and starting-up of the computer, a specimen (sampling disc) is placed on the sample stage of the instrument. Afterwards, analysis is executed by the customized software. A single batch of analysis for one specimen normally takes 5 minutes and the result is shown on a display automatically.

3.6 Since the XRF analysis does not affect any properties of the specimens, all of the collected specimens (six to nine specimens), including those for the second analysis and storage, are able to be used for this analysis.

4 Interpretation of the result at the first-stage analysis

4.1 Following the procedures above, XRF data of six, or nine, specimens are obtained for each sampling point. Omitting the maximum and minimum values from the data, an average of the tin content is calculated from the intermediate values for the representing value of the sampling point.

4.2 Compliance with the Convention is assumed when none of the tin contents (average values) from the samples do not exceed the sum of the threshold (2,500 mg per kg) and a tolerance (500 mg per kg).

4.3 When one or more average values of samples from different sampling points do not meet the above criteria, the samples should be sent to a laboratory for the second stage analysis. Regardless of the results, it is also possible to undergo the second stage analysis when the surveyor or PSCO considers that it is necessary to do so.

5 Second-stage analysis

5.1 Since the second-stage analysis provides the final and definitive results of the samples, the method should be thoroughly reviewed by experts based on scientific evidence. The following is a brief summary of a tentative methodology for the second stage analysis.

5.2 The collected paint specimens are removed from the abrasive paper and total mass is measured with an electronic balance to an order of 0.1 mg. The specimens are hydrolysed with sodium hydroxide aqueous solution, extracted with organic solvent, and then derivatised with propylmagnesium bromide. After cleaning up the extract, analysis using high resolution gas chromatography/mass spectrometry (GC/MS) is carried out. For quantification analysis, tetrabutyl tin d36 is added as the internal standard.

5.3 These analyses provide the data of chemical species and their content (mg per kg of the specimens). The content of organotin is obtained in a unit of mg per kg of dry paint.

6 Compliance with the Convention

6.1 Compliance with the Convention is assumed when the results from the second-stage analysis meet the following requirements at the same time:

.1 no more than 25% of the total number of samples yield results above 2,500 milligrams tin as organic form per kilogram dry paint (2,500 mg Sn/kg of dry paint); and

.2 no sample of the total number of specimens shows a concentration of tin as organic form higher than the sum of the threshold value plus the tolerance range, i.e., no sample must exceed the concentration 3,000 mg Sn/kg dry paint.

6.2 When the result does not meet the above criteria, it is interpreted to mean that organotin compounds are present in the anti-fouling system at a level where they would act as a biocide.

Appendix to method 2

Record sheet for the sampling and analysis of anti-fouling systems on ship hulls – organotin compounds

	Record number
Section A: Administration	
1 Country	2 Location
3 Date	
4 Reason for survey inspection	
5 Details of the ship	
5.1 Name of ship	
5.2 Distinctive number or letters	
5.3 Gross tonnage	5.4 Year of build
5.5 Ownership or operator of ship	
5.6 Flag State	5.7 Class of ship
5.8 Authority of AFS Certificate	
5.9 Date of issue	
5.10 Date of last endorsement	
5.11 IMO number	
5.12 Name of shipmaster	
5.13 Product name of anti-fouling systems	
5:14 Name of manufacturer	
5.15 Name of shipyard where applied	
5.16 Comments	
6 Inspecting official's details	
6.1 Name	
6.2 Comments	

Record number

Section B: Sampling and stage 1 analysis (x-ray fluorescence analysis)
Date
Instrument I.D.

Sample/Location	Specimen I.D.	Sampling disc	Content of tin (mg/kg)	max	min	Average
A	A1	☐ abrasives		☐	☐	Average _____ mg/kg ☐ > 2,500 mg/kg ☐ > 3,000 mg/kg
	A2	☐ metal		☐	☐	
	A3	☐ others		☐	☐	
	A4	☐ abrasives		☐	☐	
	A5	☐ metal		☐	☐	
	A6	☐ others		☐	☐	
	A7	☐ abrasives		☐	☐	
	A8	☐ metal		☐	☐	
	A9	☐ others		☐	☐	
B	B1	☐ abrasives		☐	☐	Average _____ mg/kg ☐ > 2,500 mg/kg ☐ > 3,000 mg/kg
	B2	☐ metal		☐	☐	
	B3	☐ others		☐	☐	
	B4	☐ abrasives		☐	☐	
	B5	☐ metal		☐	☐	
	B6	☐ others		☐	☐	
	B7	☐ abrasives		☐	☐	
	B8	☐ metal		☐	☐	
	B9	☐ others		☐	☐	
C	C1	☐ abrasives		☐	☐	Average _____ mg/kg ☐ > 2,500 mg/kg ☐ > 3,000 mg/kg
	C2	☐ metal		☐	☐	
	C3	☐ others		☐	☐	
	C4	☐ abrasives		☐	☐	
	C5	☐ metal		☐	☐	
	C6	☐ others		☐	☐	
	C7	☐ abrasives		☐	☐	
	C8	☐ metal		☐	☐	
	C9	☐ others		☐	☐	

Sample/Location	Specimen I.D.	Sampling disc	Content of tin (mg/kg)	max	min	Average
D	D1	☐ abrasives		☐	☐	
	D2	☐ metal		☐	☐	Average
	D3	☐ others		☐	☐	_____ mg/kg
	D4	☐ abrasives		☐	☐	
	D5	☐ metal		☐	☐	☐ > 2,500 mg/kg
	D6	☐ others		☐	☐	☐ > 3,000 mg/kg
	D7	☐ abrasives		☐	☐	
	D8	☐ metal		☐	☐	
	D9	☐ others		☐	☐	

☐ Stage II required ☐ _____ samples out of _____ are above 2,500 mg/kg ☐ Sample _____ is above 3,000 mg/kg	☐ Compliant

Sampled by	Analysed by
Signature	Signature

	Record number

Section C: Stage II analysis (gas chromatograph mass spectrometry)				
Date				
Instrument I.D.				
Comments on the method				
Sample I. D.	Specimen used	Content of tin (XRF analysis) (mg/kg)	Content of tin (as organotin) (mg/kg)	Compliance
A				☐ > 2,500 mg/kg ☐ > 3,000 mg/kg
B				☐ > 2,500 mg/kg ☐ > 3,000 mg/kg
C				☐ > 2,500 mg/kg ☐ > 3,000 mg/kg
D				☐ > 2,500 mg/kg ☐ > 3,000 mg/kg

4 Conclusion ☐ Not compliant ____ samples out of ____ are above 2,500 mg(Sn)/kg (dry paint) Sample(s) _____ is (are) above 3,000 mg(Sn)/kg (dry paint) ☐ Compliant	
5 Additional comments	
6 Laboratory name	
7 Analysed by	8 Signature

Section D: Final conclusion	
1 Conclusion ☐ Anti-fouling system is compliant with the AFS Convention 2001 ☐ Anti-fouling system is NOT compliant with the AFS Convention 2001	
2 Comments	
3 Processed official	
	3.1 Name
	3.2 Date
	3.3 Signature
4 Authorized administrator	
	4.1 Name
	4.2 Date
	4.3 Signature

Resolution MEPC.105(49)

Adopted on 18 July 2003

GUIDELINES FOR INSPECTION OF ANTI-FOULING SYSTEMS ON SHIPS

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee conferred upon it by the international conventions for the prevention and control of marine pollution,

RECALLING ALSO that the International Conference on the Control of Harmful Anti-fouling Systems for Ships, 2001, held in October 2001, adopted the International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001 (the AFS Convention) together with four Conference resolutions,

RECALLING FURTHER that Article 11 of the AFS Convention prescribes that ships to which this Convention applies may, in any port, shipyard, or offshore terminal of a Party, be inspected by officers authorized by that Party for the purpose of determining whether the ship is in compliance with this Convention,

NOTING that Article 3(3) of the AFS Convention prescribes that Parties to this Convention shall apply the requirements of this Convention as may be necessary to ensure that no more favourable treatment is given to ships of non-Parties to this Convention,

NOTING ALSO that Article 11(2) of the AFS Convention refers to the guidelines to be developed by the Organization and Conference resolution 2 urges the Organization to develop these guidelines as a matter of urgency for them to be adopted before the entry into force of the Convention,

NOTING FURTHER that through resolutions MEPC.102(48) and MEPC.104(49) the Organization has developed "Guidelines for survey and certification of anti-fouling systems on ships and "Guidelines for brief sampling of anti-fouling systems on ships, respectively, and

HAVING CONSIDERED the draft Guidelines for inspection of anti-fouling systems on ships pursuant to the International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001, prepared by the Sub-Committee on Flag State implementation at its eleventh session,

1. ADOPTS the Guidelines for inspection of anti-fouling systems on ships pursuant to the International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001, as set out in the annex to this resolution;

2. INVITES Governments to apply the Guidelines as soon as possible, or when the Convention becomes applicable to them; and

3. RECOMMENDS that the Guidelines be adopted as amendments to resolution A.787(19) on Procedures for port State control, as further amended by resolution A.882(21) once the AFS Convention has entered into force and that the Guidelines be reviewed on a regular basis.

Annex

Guidelines for inspection of anti-fouling systems on ships

PART 1

Port State control inspections of anti-fouling systems on ships are governed by Article 11 of the AFS Convention. The process for conducting these inspections is described below. The flow diagram in the Appendix to this annex also describes the AFS port State inspection process.

SUB-PART 1

INSPECTION OF INTERNATIONAL ANTI-FOULING SYSTEM (IAFS) CERTIFICATE OR DECLARATION ON ANTI-FOULING SYSTEM

1 Ships required to carry an IAFS Certificate or Declaration on Anti-Fouling System

.1 On boarding and introduction to the master or responsible ship's officer, the port State control officer (PSCO) should examine the IAFS Certificate or Declaration on Anti-Fouling System, and the attached Record of Anti-Fouling Systems, if appropriate.

.2 The IAFS Certificate carries the information on the particulars of the ship and a series of checkboxes to indicate if an anti-fouling system controlled under annex I of AFS 2001 has or has not been applied, removed or been covered with a sealer coat, and if an anti-fouling system controlled under annex I of AFS 2001 was applied on the ship prior to or after the date specified in AFS 2001.

.3 As a preliminary check, the validity of the IAFS Certificate should be confirmed by verifying that the IAFS Certificate is properly completed and signed/endorsed by the Administration, or by a recognized organization (RO) and stating that the required survey has been performed. In reviewing the IAFS Certificate, particular attention should be given to verifying that the initial survey matches the dry dock period listed in the ship's log(s) and that only one box should be marked.

.4 The Record of Anti-Fouling Systems should be inspected to ensure that the records are attached to the IAFS Certificate and are up to date. The most recent Record must correlate with the correct checkbox on the front of the IAFS Certificate.

2 Ships of non-Parties to AFS 2001

.1 As ships of non-Parties to AFS 2001 are not entitled to an IAFS Certificate, the PSCO should look for documentation that contains all of the information in the IAFS Certificate. The records described in resolution MEPC.102(48), paragraphs 5.2.2 and 5.3.2 can be used as examples of this types of documentation. If the ship has such documentation, the PSCO may take its content into account in the evaluation of that ship's compliance.

.2 In all other respects the PSCO should be guided by the procedures for ships referred to in paragraph 1 above (Ships required to carry an IAFS Certificate).

SUB-PART 2

BRIEF SAMPLING OF ANTI-FOULING SYSTEMS ON SHIPS

1 In addition to reviewing the IAFS Certificate, the AFS 2001 specifies that the inspection may also include a brief sampling of the ship's anti-fouling system. The sampling must not affect the integrity, structure, or operation of the anti-fouling system, taking into account the guidelines contained in resolution MEPC.104(49).

2 If a brief sampling is conducted, the time to process the results shall not be used as a basis for preventing the movement and departure of the ship.

PART 2

MORE THOROUGH INSPECTION

1 If the results of the inspection, observations on board, or other information leads to clear grounds for believing that the ship is in violation of the AFS 2001, or if the anti-fouling system does not correspond substantially with the particulars of the IAFS Certificate, a more thorough inspection may be carried out taking into account any of the following steps.

2 Inspection of additional documentation, to include:

.1 ship's logs, including entries regarding:

.1 date of last repair, drydock or application of anti-fouling system, date of departure from location;

.2 current port and date of arrival; and

.3 ship's position at or near the time the boarding took place; and

.2 inspection of additional documentation described in paragraphs 5.2.2 and 5.2.3 of resolution MEPC.102(48).

3 If appropriate, spot check dates of last hull coating matches date in drydock?

4 If the IAFS Certificate is not properly completed, information on the following questions may be pertinent:

.1 "When was the last time the ship's anti-fouling system was applied?";

.2 "If the anti-fouling system is controlled under Annex 1 to AFS 2001 and was removed, what was the name of the facility and date of the work performed?";

.3 "If the anti-fouling system is controlled under Annex 1 of AFS 2001 and has been covered by a sealer coat, what was the name of the facility and date applied?";

.4 "What is the name of the anti-fouling/sealer products and the manufacturer or distributor for the existing anti-fouling system?"; and

.5 "If the current anti-fouling system was changed from the previous system, what was the type of anti-fouling system and name of the previous manufacturer or distributor?".

5 Performing additional verification, for example, more comprehensive sampling and analysis of the ship's anti-fouling system. Such sampling and analysis will likely be more detailed and comprehensive than the brief inspection that may be carried out during the initial port State control inspection, and may involve the use of laboratories and detailed scientific testing procedures. Refer to the guidelines in resolution MEPC.104(49) when conducting these additional samples or analyses.

6 Additional information available to the PSCO, depending on the circumstances of the case, such as reports of recent previous violations or alleged contraventions received from other port States.

PART 3

PORT STATE ACTION IN RESPONSE TO ALLEGED CONTRAVENTIONS

1 Article 11(4) of AFS 2001 allows Parties to inspect ships on request of another Party, if a request for an investigation is received and sufficient evidence that the ship is operating or has operated in violation of the Convention is provided. Article 12(2) permits port States conducting inspection to furnish the Administration of the ship concerned such information and evidence as may be in its possession that a violation has occurred. Experience has shown that information furnished to the flag State is often inadequate to enable the flag State to cause proceedings to be brought in respect of the alleged violation of the AFS 2001 requirements. This part is intended to identify information which is often needed by a flag State for the prosecution of such possible violations.

2 It is recommended that in preparing a port State report on deficiencies, where contravention to AFS 2001 requirements is involved, the authorities of the coastal or port State be guided by the itemized list of possible evidence as shown in part 2. It should be borne in mind in this connection that:

.1 the report aims to provide the optimal collation of obtainable data; however, even if all the information cannot be provided, as much information as possible should be submitted; and

.2 it is important for all the information included in the report to be supported by facts which, when considered as a whole, would lead the port or coastal State to believe a contravention had occurred.

3 In addition to the port State report on deficiencies, a report should be completed by a port or coastal State, on the basis of the itemized list of possible evidence. It is important that these reports are supplemented by documents such as:

.1 a statement by the PSCO of the suspected non-conforming anti-fouling system. In addition to the information required in part 2, the statement should include considerations which lead the PSCO to carry out a more detailed inspection;

.2 statements concerning any sampling procedures of the anti-fouling system. These should include: location of the vessel at the time it was sampled as well as an indication of where the sample was taken from the hull, including the vertical distance from the boot topping, the time of sampling, identity of person(s) taking the samples, and receipts identifying the persons having custody and receiving transfer of the samples;

.3 reports of analyses of any samples taken of the anti-fouling system; the reports should include the results of the analyses, a description of the method employed, reference to or copies of scientific documentation attesting to the accuracy and validity of the method employed, the names of persons performing the analyses and their experience and a description of the quality assurance measures of the analyses;

.4 a statement by the PSCO on board together with the PSCO's rank and organization;

.5 statements by persons being questioned;

.6 statements by witnesses;

.7 photographs of the hull and sample areas; and

.8 copy of the IAFS Certificate, including copies of relevant pages of the Record of Anti-fouling Systems, log books, MSDS or similar, declaration of compliance from the anti-fouling system manufacturer, invoices from the shipyard and other dry dock records pertaining to the anti-fouling system, etc.

4 All observations, photographs and documentation should be supported by a signed verification of their authenticity. All certifications, authentications or verifications should be executed in accordance with the laws of the State which prepares them. All statements should be signed and dated by the person making the statement. The names of the persons signing statements should be printed in legible script above or below the signature.

5 The reports referred to under paragraphs 2 and 3 of this part should be sent to the flag State. If the coastal State observing the contravention and the port State carrying out the investigation on board are not the same, the State carrying out the latter investigation should also send a copy of its findings to the State which initiated the investigation.

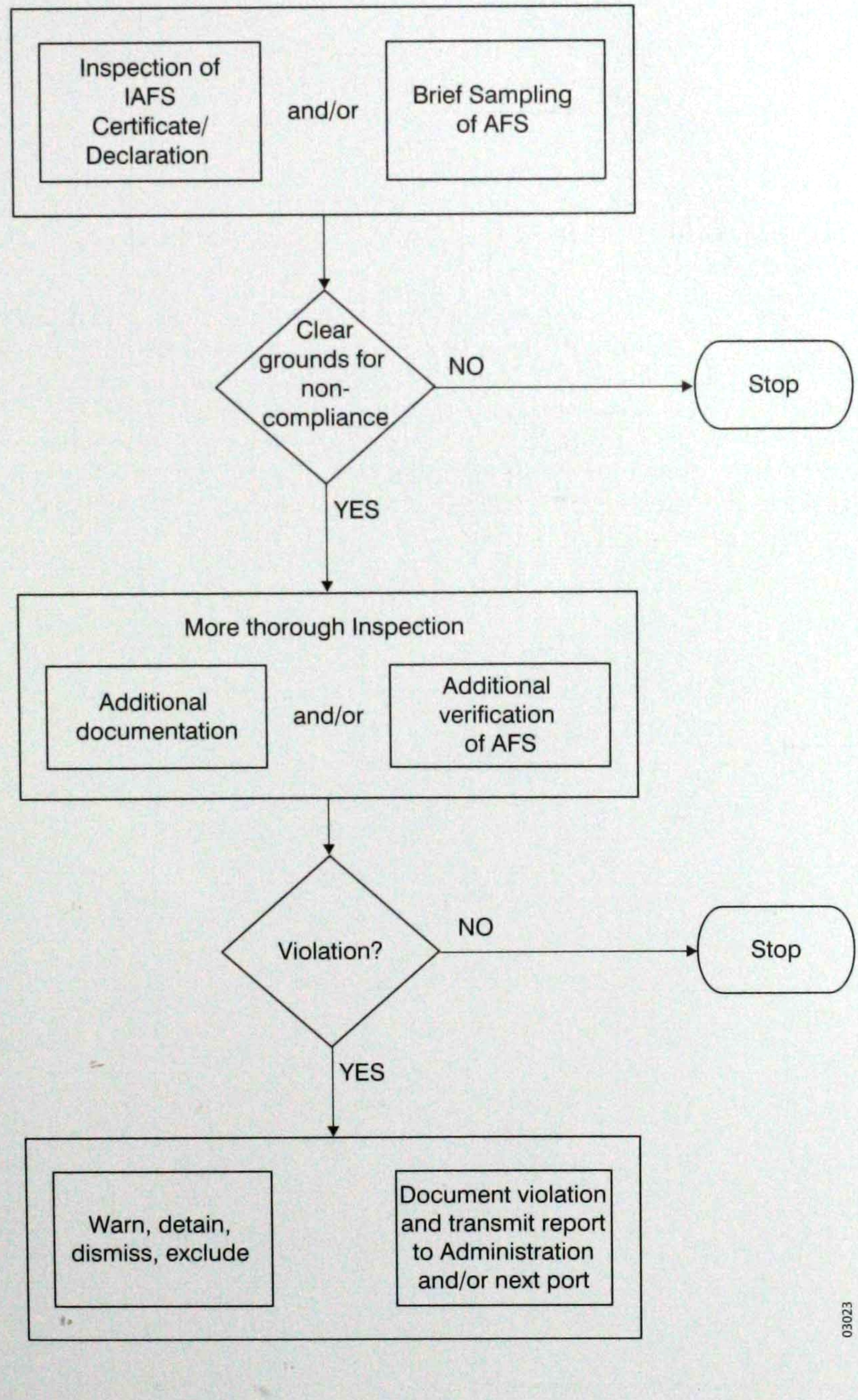
PART 4

RESPONSIBILITIES OF PORT STATE TO NOTIFY THE CONTRAVENTION TO THE FLAG STATE

1 Article 11(3) of AFS 2001 states that any time a ship is warned or detained, or is dismissed or excluded from a port for violation of the Convention, the Party taking such action shall immediately inform the flag Administration of the ship concerned. The form in appendix 5 should be used to inform the flag Administration. In the event that the deficiencies identified by the PSCO cannot be corrected in the port of inspection and the ship is allowed to sail from that port, the guidance in paragraph 4.7.3 and the forms in appendices 6 and 7 should be used.

Appendix

AFS port State inspection process



03023

ISBN 978-92-801-4195-5

9 789280 141955

Sales number: IA680E

Annex 4

Resolution MEPC.331(76)

(adopted on 17 June 2021)

Amendments to the International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001

ANNEX 4

RESOLUTION MEPC.331(76)
(adopted on 17 June 2021)

AMENDMENTS TO THE INTERNATIONAL CONVENTION ON THE CONTROL OF HARMFUL ANTI-FOULING SYSTEMS ON SHIPS, 2001

Amendments to Annexes 1 and 4

(Controls on cybutryne and form of the International Anti-fouling System Certificate)

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee conferred upon it by international conventions for the prevention and control of marine pollution from ships,

RECALLING ALSO article 16 of the International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001 (the AFS Convention), which specifies the amendment procedure and confers upon the Marine Environment Protection Committee of the Organization the function of considering amendments thereto for adoption by the Parties,

HAVING CONSIDERED, at its seventy-sixth session, proposed amendments to the AFS Convention regarding controls on cybutryne and the form of the International Anti-fouling System Certificate,

1 ADOPTS, in accordance with article 16(2)(c) of the AFS Convention, amendments to Annexes 1 and 4, the text of which is set out in the annex to the present resolution;

2 DETERMINES, in accordance with article 16(2)(e)(ii) of the AFS Convention, that the amendments shall be deemed to have been accepted on 1 July 2022 unless prior to that date more than one third of the Parties have notified the Secretary-General that they object to the amendments;

3 INVITES the Parties to note that, in accordance with articles 16(2)(f)(ii) and (iii) of the AFS Convention, the said amendments shall enter into force on 1 January 2023 upon their acceptance in accordance with paragraph 2 above;

4 INVITES ALSO the Parties to remind ships that fly their flag and that are confirmed to be affected by the amendments to Annex 1 to the AFS Convention adopted through the present resolution to make a timely request for a survey for the issuance of an International Anti-fouling System Certificate, in the amended model form adopted through the present resolution, using the procedure outlined in paragraphs 4 and 5.3 of the annex to resolution MEPC.195(61), as may be amended by the Organization, so that ships have a valid International Anti-fouling System Certificate on board not later than 24 months after the entry into force of the amendments to Annex 1 to the AFS Convention adopted through the present resolution;

5 INVITES FURTHER the Parties to issue new International Anti-fouling System Certificates, in the amended model form adopted through the present resolution, at the next anti-fouling system application, in the case of ships that are confirmed not to be affected by the amendments to Annex 1 to the AFS Convention adopted through the present resolution;

6 REQUESTS the Secretary-General, for the purposes of article 16(2)(d) of the AFS Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Parties to the AFS Convention;

7 REQUESTS ALSO the Secretary-General to transmit copies of the present resolution and its annex to Members of the Organization which are not Parties to the AFS Convention;

8 REQUESTS FURTHER the Secretary-General to prepare a consolidated certified text of the AFS Convention.

ANNEX

AMENDMENTS TO THE INTERNATIONAL CONVENTION ON THE CONTROL OF HARMFUL ANTI-FOULING SYSTEMS ON SHIPS, 2001

Annex 1
Controls on anti-fouling systems

1 The following rows are added to the table in Annex 1 to the 2001 AFS Convention:

"

Anti-fouling system	Control measures	Application	Effective date
Cybutryne CAS No. 28159-98-0	Ships shall not apply or re-apply anti-fouling systems containing this substance	All ships	1 January 2023
Cybutryne CAS No. 28159-98-0	Ships bearing an anti-fouling system that contains this substance in the external coating layer of their hulls or external parts or surfaces on 1 January 2023 shall either: (1) remove the anti-fouling system; or (2) apply a coating that forms a barrier to this substance leaching from the underlying non-compliant anti-fouling system	All ships except: (1) fixed and floating platforms, FSUs, and FPSOs that have been constructed prior to 1 January 2023 and that have not been in dry-dock on or after 1 January 2023; (2) ships not engaged in international voyages; and (3) ships of less than 400 gross tonnage engaged in international voyages, if accepted by the coastal State(s)	At the next scheduled renewal of the anti-fouling system after 1 January 2023, but no later than 60 months following the last application to the ship of an anti-fouling system containing cybutryne

"

Annex 4
Surveys and certification requirements for anti-fouling systems

2 Regulation 2(3) is replaced by the following:

"(3) For ships bearing an anti-fouling system controlled under Annex 1 that was applied before the date of entry into force of a control for such a system, the Administration shall issue a Certificate in accordance with paragraphs (1) and (2) of this regulation not later than two years after entry into force of that control. This paragraph shall not affect any requirement for ships to comply with Annex 1."

Appendix 1 to Annex 4
Model form of International Anti-fouling System Certificate

3 The section of the model form of the International Anti-fouling System Certificate (appendix 1) listing the compliance options for controlled anti-fouling systems on the ship is replaced by the following:

"An anti-fouling system controlled under Annex 1 containing:

	Has not been applied during or after construction of this ship	**Has been applied on this ship previously, but has been removed by**	**Has been applied on this ship previously, but has been covered with a sealer coat applied by**	**Has been applied on this ship previously, but is not in the external coating layer of the hull or external parts or surfaces on**	**Was applied on this ship prior to**
Organotin compounds which act as biocides	☐	……. *(insert name of the facility)* on ……. *(dd/mm/yyyy)* ☐	……. *(insert name of the facility)* on ……. *(dd/mm/yyyy)* ☐	Not applicable	Not applicable
Cybutryne	☐	……. *(insert name of the facility)* on ……. *(dd/mm/yyyy)* ☐	……. *(insert name of the facility)* on ……. *(dd/mm/yyyy)* ☐	1 January 2023 ☐	1 January 2023, but must be removed or covered with a sealer coat prior to ……. *(dd/mm/yyyy)* ☐

"

***

Annex 19

Resolution MEPC.356(78)

(adopted on 10 June 2022)

2022 Guidelines for Brief Sampling of Anti-fouling Systems on Ships

ANNEX 19

RESOLUTION MEPC.356(78)
(adopted on 10 June 2022)

2022 GUIDELINES FOR BRIEF SAMPLING OF ANTI-FOULING SYSTEMS ON SHIPS

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee conferred upon it by the international conventions for the prevention and control of marine pollution,

RECALLING ALSO that the International Conference on the Control of Harmful Anti-fouling Systems for Ships, 2001, held in October 2001, adopted the International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001 (the AFS Convention) together with four Conference resolutions,

NOTING that article 11(1) of the AFS Convention prescribes that ships to which this Convention applies may, in any port, shipyard, or offshore terminal of a Party, be inspected by officers authorized by that Party for the purpose of determining whether the ship is in compliance with this Convention, that such inspection may include brief sampling of the ship's anti-fouling system, and that article 11(1) of the AFS Convention refers to the guidelines to be developed by the Organization,

NOTING ALSO resolution MEPC.104(49) by which the Committee adopted the *Guidelines for brief sampling of anti-fouling systems on ships*,

RECALLING FURTHER that at its seventy-sixth session it adopted amendments to the AFS Convention to introduce controls on cybutryne through resolution MEPC.331(76),

RECOGNIZING the need for a consequential revision of the guidelines associated with the AFS Convention due to the aforementioned amendments,

NOTING FURTHER that through resolutions MEPC.358(78) and MEPC.357(78) the Organization adopted *2022 Guidelines for survey and certification of anti-fouling systems on ships* and *2022 Guidelines for inspection of anti-fouling systems on ships*, respectively,

HAVING CONSIDERED a revised text of the *Guidelines for brief sampling of anti-fouling systems on ships* prepared by the Sub-Committee on Pollution Prevention and Response at its ninth session,

1 ADOPTS the *2022 Guidelines for brief sampling of anti-fouling systems on ships* (2022 Guidelines), the text of which is set out in the annex to this resolution;

2 INVITES Governments to apply the 2022 Guidelines as soon as possible, or when the Convention becomes applicable to them;

3 RECOMMENDS that the Guidelines be reviewed on a regular basis;

4 REVOKES resolution MEPC.104(49).

ANNEX

2022 GUIDELINES FOR BRIEF SAMPLING OF ANTI-FOULING SYSTEMS ON SHIPS

TABLE OF CONTENTS

1 General

Purpose

1.1 Article 11 of the International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001, hereinafter referred to as "the Convention", and resolution MEPC.358(78) on *2022 Guidelines for survey and certification of anti-fouling systems on ships*, refer to sampling as a method of verification of compliance of a ship's anti-fouling system with the Convention for inspection and survey.

1.2 The *Guidelines for brief sampling of anti-fouling systems on ships*, hereinafter referred to as "the Guidelines", provide procedures for sampling to support the effectiveness of survey and inspection to ensure that a ship's anti-fouling system complies with the Convention and thus assists:

.1 Administrations and recognized organizations (ROs) in the uniform application of the provisions of the Convention;

.2 port State control officers with guidance on methods and handling of brief sampling in accordance with article 11(1)(b) of the Convention; and

.3 companies, shipbuilders, manufacturers of anti-fouling systems, as well as any other interested parties, in understanding the process of sampling as required in terms of the Convention.

1.3 However, inspections or surveys do not necessarily always need to include sampling of the anti-fouling system.

1.4 These Guidelines apply to surveys and inspections of ships subject to the Convention.

1.5 The sole purpose of the sampling activities described in the Guidelines is to verify compliance with the provisions of the Convention. Consequently, such activities do not relate to any aspect not regulated by the Convention (even if such aspects relate to the performance of an anti-fouling system on the hull of a ship, including the quality of workmanship).

Structure of these Guidelines

1.6 These Guidelines contain:

.1 a main body covering aspects of general nature common to "sampling" procedures related to the regulation of anti-fouling systems controlled by the Convention; and

.2 appendices describing the unique procedures associated with the sampling and analysis of anti-fouling systems controlled by the Convention. These appendices only serve as examples of sampling and analytical methods, and other sampling methods not described in an appendix may be used subject to the satisfaction of the Administration or the port State, as appropriate.

1.7 For reasons including the event of further anti-fouling systems becoming controlled under the Convention, or in the light of new experience acquired, these Guidelines may need to be reviewed or amended in the future.

2 Definitions

For the purposes of these Guidelines:

2.1 "Administration" means the Government of the State under whose authority the ship is operating. With respect to a ship entitled to fly a flag of a State, the Administration is the Government of that State. With respect to fixed or floating platforms engaged in exploration and exploitation of the seabed and subsoil thereof adjacent to the coast over which the coastal State exercises sovereign rights for the purposes of exploration and exploitation of their natural resources, the Administration is the Government of the coastal State concerned.

2.2 "Anti-fouling system" means a coating, paint, surface treatment, surface or device that is used on a ship in order to control or prevent attachment of unwanted organisms.

2.3 "Threshold value" means the concentration limit of the chemical under investigation below which compliance with the relevant provisions of the Convention may be assumed.

2.4 "Company" means the owner of the ship or any other organization or person such as the manager or the bareboat charterer, who has assumed the responsibility for the operation of the ship from the owner of the ship and who, on assuming such responsibility, has agreed to take over all duties and responsibilities imposed by the International Safety Management (ISM) Code.

2.5 "Length" means the length as defined in the International Convention on Load Lines, 1966, as modified by the Protocol of 1988 relating thereto, or any successor Convention.

2.6 "Tolerance range" means the numerical range added to the threshold value indicating the range where detected concentrations above the threshold value are acceptable due to recognized analytical inaccuracy and thus do not compromise the assumption of compliance.

3 Personnel safety when sampling

Health

3.1 Persons carrying out sampling should be aware that solvents or other materials used for sampling may be harmful. Wet paint which is sampled may also be harmful. In these cases, the material safety data sheet (MSDS) for the solvent or paint should be read and appropriate precautions should be taken. This will normally include the wearing of long sleeve solvent resistant gloves of suitable impervious material, e.g. nitrile rubber.

3.2 Quantities of dry anti-fouling paint removed during sampling from ships' hulls will normally be too small to cause significant health effects.

Safety

3.3 Access to ships to carry out sampling safely may be difficult. If a ship is moored alongside, persons carrying out sampling must ensure they have safe access to reach the hull from, for example, platforms, crane baskets, cherry pickers or gangways. They must ensure that they are protected by railings or a climbing harness or take other precautions so that they cannot fall into the water between the quay and the ship. If in doubt a lifejacket, and possibly a safety line, should be worn when sampling.

3.4 Access to ships in dry dock should be made by secure means. Scaffolding should be securely constructed and cherry pickers or dock-arms should be properly constructed and maintained if they are to be used to gain access. There should be a system to record the presence of the inspector in the dock area, and he or she should preferably be accompanied. Safety harnesses should be worn in cherry-picker baskets, if used.

4 Sampling and analysis

Sampling methods

4.1 During sampling, care should be taken not to affect the integrity or operation of the anti-fouling system.

4.2 Sampling where the anti-fouling coating is visibly damaged[1] or on block mark areas on the flat bottom of the ship (where the intact anti-fouling system is not applied) should be avoided. Sampling adjacent to or below areas where the anti-fouling system is damaged should also be avoided. When a sample point on the hull has been selected, any fouling present should be removed with water and a soft sponge/cloth before taking a specimen of the anti-fouling system (to avoid contamination of the sample). Where possible, if carried out in dry dock, sampling should be carried out after the hull has been water-washed.

4.3 The materials required for brief sampling methodologies should ideally be inexpensive, widely available and therefore readily accessible, irrespective of sampling conditions and/or location.

4.4 The sampling procedure should ideally be easily and reliably undertaken. Persons conducting sampling should receive appropriate training in sampling methods.

Technical aspects

4.5 The sampling method should take into account the type of anti-fouling system used on the ship (taking into account that different parts of the hull may be treated with different anti-fouling systems).

4.6 Sampling and analysis of the ship's anti-fouling system could be related to only one or to all of the substances listed in Annex 1 of the AFS Convention. The following cases could be considered:

Case A. Analysis of organotin only

Case B. Analysis of cybutryne only

Case C. Simplified approach to detect organotin and cybutryne

4.7 Depending on the case, the number of samples, analysis, and definition of compliance will differ.

[1] During in-service periods, anti-fouling coatings on ships' hulls often become damaged. The extent of damage varies between ships and damaged areas can be visually recognized. Typically, damage can be restricted to localized areas, e.g. anchor chain damage (bow region), fender damage (vertical sides of hull), "rust through areas" (underlying rust causing coating failure), or in some cases can be in smaller areas scattered over larger areas of the hull (usually older ships where over-coating of the original system has taken place many times).

4.8 Specimens of paint for analysis during survey and certification can be taken either as wet paint[2] from product containers, or dry paint film sampled from the hull.

Sampling strategy and number of samples

4.9 The sampling strategy is dependent on the precision of the sampling method, the analytical requirements, costs, and required time and the purpose of the sampling. The number of paint specimens taken of each sample should allow for a retention quantity for back-up/storage in the event of a dispute. For dry samples, triplicate specimens of paint at each sampling point should be taken in close proximity to each other on the hull (e.g. within 10 cm of each other).

4.10 In cases where it is recognized that more than one type of anti-fouling system is present on the hull, where access can be gained, samples should be taken from each type of system:

.1 For survey purposes or for more thorough inspections pursuant to article 11(2) of the Convention, in order to verify the compliance of an anti-fouling system, the number of sample points should reflect representative areas of the ship's hull.

.2 For inspection purposes pursuant to article 11(1) of the Convention sample points on the hull should be selected covering representative areas where the anti-fouling system is intact. Depending on the size of the ship and accessibility to the hull, at least four sample points should be equally spaced down the length of the hull. If sampling is undertaken in dry dock, flat bottom areas of the hull should be sampled in addition to vertical sides as different anti-fouling systems can be present on these different areas.

4.11 The distribution of any remaining anti-fouling paint on the hull surface may not be uniform. Therefore, it is important that the sampling is representative of the hull status; see *Guidelines for survey and certification of anti-fouling systems on ships*, appendix I, paragraph 2).

Analysis

4.12 The analysis of the anti-fouling system should ideally involve minimal analytical effort and economic cost.

4.13 The analysis should be conducted by a recognized laboratory meeting the ISO 17025 standard or another appropriate facility at the discretion of the Administration or the port State.

4.14 The analytical process should be expeditious, such that results are rapidly communicated to the officers authorized to enforce the Convention.

[2] In order to prevent contamination, wet paint samples should be taken from a newly opened container. Paint should be stirred to ensure even consistency before sampling and all equipment used should be cleaned prior to use. Liquid paint samples should be stored in appropriate sealed packaging which will not react with or contaminate the sample. In the case of multi-component coatings (where on-site mixing of several components is required prior to application), samples of each component should be taken and the required mixing ratio recorded. When a sample of wet paint is taken from a container, details of the paint should be recorded, e.g. details required for the IAFS Certificate along with a batch number for the product.

4.15 The analysis should produce unambiguous results expressed in units consistent with the Convention and its associated guidelines. For example, for organotin, results should be expressed as: mg tin (Sn) per kg of dry paint, and, for cybutryne: mg of cybutryne per kg of dry paint.

NOTE: Compound-specific sampling and analytical methodologies are described in the appendices to these Guidelines.

5 Thresholds and tolerance limits

Thresholds

5.1 The analysis should be quantitative to the point of being able to accurately verify the threshold limits within the given tolerance.

5.2 In cases where compliance with acceptable limits, or lack thereof, is unclear, additional sampling or other methodologies for sampling should be considered.

Tolerance range

5.3 Statistical reliability for each (compound-specific) brief sampling procedure should be documented. The analysis should be quantitative to the point of being able to accurately verify the threshold limits within the given tolerance. On the basis of these data a compound-specific tolerance range should be derived and stated in the method description. In general, the tolerance range should not be higher than the standard deviation under typical conditions for testing and should under no circumstances go beyond 30%.

6 Definition of compliance

6.1 Compliance with Annex 1 to the Convention is assumed if the anti-fouling system contains:

.1 organotin at a level which does not provide a biocidal effect. In practice organotin compounds should not be present above 2,500 mg organotin (measured as Sn) per kg of dry paint; and

.2 cybutryne at a level which does not provide a biocidal effect. It should not be present above 1,000 mg of cybutryne per kg of dry paint.

6.2 Compliance is largely dependent on the results of sampling and subsequent analysis. As every method of sampling and analysis has its specific accuracy, a compound-specific tolerance level may be applied in borderline cases with concentrations very close to the threshold level.

6.3 In general, compliance is assumed when the samples yield results below the threshold value.

7 Documentation and recording of information

7.1 The results of the sampling procedure should be fully documented on a method-specific record sheet. Examples are provided in the appendices to these Guidelines.

7.2 Such record sheets should be completed by the sampler and should be submitted to the competent authority of the port State or Administration.

APPENDIX

POSSIBLE METHODS FOR BRIEF SAMPLING AND ANALYSIS OF ANTI-FOULING SYSTEMS ON SHIPS

- ORGANOTIN AND/OR CYBUTRYNE -

METHOD 1

1 Purpose of this method concerning brief sampling and analysis of anti-fouling systems

1.1 This method has been developed in order to describe a rapid methodology appropriate for the identification of anti-fouling systems on ship hulls containing organotin compounds and/or cybutryne acting as biocide. This method has been designed such that sealers should not be affected, and any underlying anti-fouling agent (or primer) is not taken up in the sampling procedure. The method is not recommended for silicon-based anti-fouling systems.

1.2 The method for organotin compounds (Case A under paragraph 4.6 of the Guidelines) is based on a two-step analysis. The first step detects total tin as an indicator for organotin; the second step, detecting specific organotin compounds, is only necessary in the case of the first step proving positive.

1.3 The method for cybutryne (Case B under paragraph 4.6 of the Guidelines) is based on a one-step analysis.

1.4 The simplified approach (Case C under paragraph 4.6 of the Guidelines) to detect organotin compounds and cybutryne is based on a one-step analysis.

2 Sampling device and materials

2.1 The sampling device is constructed in a way that only the upper layer of paint is removed, thereby it should leave any underlying paint (sealer, primer, etc.) intact. This result is achieved through the use of a moving disk (eccentric rotation), which is covered by an abrasive material like quartz or glass fibre fabric. This abrasive material has to be suitable for its use as a supporting material for the removed paint.

2.2 The device fulfils the following requirements:

.1 the device has to work independently from any stationary power supply. The device may be driven by an electrical motor (battery-driven) or may be mechanically driven by a clockwork-like spring, provided it is able to sustain the movement over the required time period;

.2 the applied force has to be constant during the operation, and the area for paint removal has to be defined;

.3 the abrasive material has to be inert against chemical solvents and acids and must not contain more than trace amounts of tin or tin compounds and/or cybutryne; and

.4 the amount of paint removed after a regular operation of the device has to be shown to exceed 20 mg per sample.

2.3 The device as described in the following section has been shown to be suitable for the brief sampling procedure. Any other device may be used however, provided such a device has proven to meet all the above-mentioned requirements.

2.4 The sampling device described here consists of a polyethylene disk, on which fibre glass fabric can be mounted by the use of an O-ring. The disk is moved on an eccentrically rotating axis.

3 Sampling procedure

3.1 The sampling procedure should be performed in the following manner:

.1 control samples should be taken through the entire sampling and analytical process to account for possible contamination;

.2 the mass of the fibreglass pads is weighed with a precision of at least 1 mg. The weight should be documented for each sample;

.3 the fabric should be moistened thoroughly with isopropanol (0.7 mL per sample) immediately before sampling;

.4 when a sample point on the hull has been selected, any fouling present should be removed with water and a soft sponge/cloth before taking a specimen of the anti-fouling system (to avoid contamination of the sample). Where possible, if carried out in dry dock, sampling should be carried out after the hull has been water-washed;

.5 the sampling device is then held against the surface to be sampled for a period of five seconds, prior to the sampling device being switched on;

.6 the sampling device is switched on, thereby removing paint by the circular motion of the fibre glass fabric against the surface of the ship;

.7 the sampling device should be applied to the surface of the hull for a suitable period of time, such that at least 20 mg of paint is taken up by the pad. As a general rule, if the pad colour after sampling matches the colour of the hull coating a sufficient sample has been taken;

.8 the specimens should be taken as close to each other as possible, but without overlap;

.9 upon completion of the sampling, the fibreglass fabric pads should be left to dry and re-weighed;

.10 the number of samples will differ depending on the substances targeted as listed in Annex 1 of the AFS Convention.

Case A. Analysis of organotin only, every sample should be taken in triplicate.

Specimen 'A' – for Step 1
Specimen 'B' – for Step 2
Specimen 'X' – for storage/back-up

Case B. Analysis of cybutryne only, every sample should be taken in duplicate.

Specimen 'C' – for a one-step analysis
Specimen 'X' – for storage/back-up

Case C. Simplified approach to detect organotin and cybutryne, every sample should be taken in duplicate.

Specimen 'C' – for a one-step analysis
Specimen 'X' – for storage/back-up

3.2 Samples should be stored in appropriate sealed packaging which will not react with or contaminate the sample.

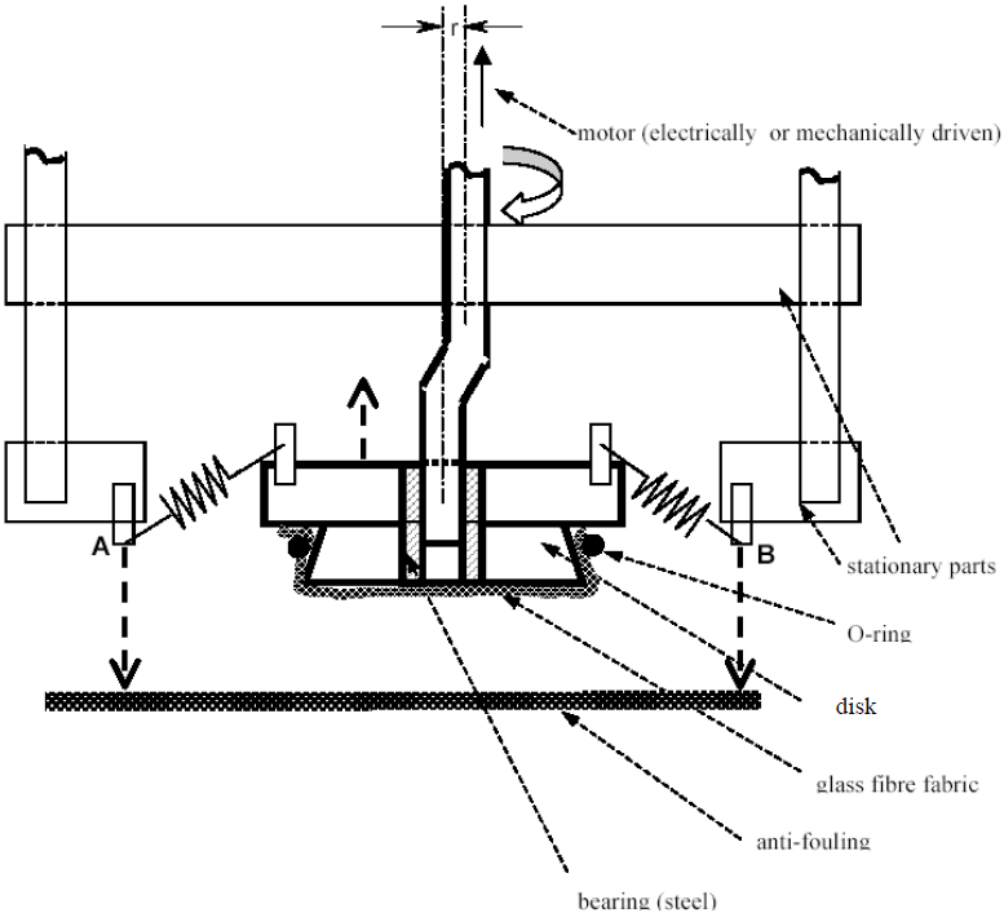


Diagram A: Schematic cross section of the sampling device

The indicated points A and B are to be pressed against the surface. The polyethylene disk, covered with the glass fibre fabric, is moved with an amplitude of 2 r (r = 1.0 cm) on the surface.

Specific data:

Force applied on the paint surface:	25 N (Newton)
Effective diameter of the disk:	5 cm
Frequency of rotation:	6 rotations/s
Solvent used:	isopropanol (0.8 mL per sample).

4 Sampling strategy

4.1 Sampling should be conducted in accordance with paragraph 4 of the Guidelines.

4.2 For inspection purposes in most cases accessibility to all parts of the hull will not be given. A minimum number of eight independent samples should be taken from different accessible parts of the hull.

5 Analytical procedure

5.1 The analytical procedure will differ depending on the substances targeted as listed in Annex 1 of the AFS Convention.

Case A. Analysis of organotin only

5.2 The two components comprising the analytical procedure are illustrated in the flow diagram B. The two components, or steps, are as follows:

.1 (Step 1) – An analysis of Specimen 'A' for the presence of total tin; and

.2 (Step 2) – A more cost- and time-consuming analysis of Specimen 'B', that is applied only when Step 1 produces positive results. This test involves organotin analysis by gas chromatography/mass spectrophotometry (GC/MS) after derivatization and provides specific data on the respective organotin species.

Step 1: Investigation of total tin content in Specimen 'A'

Analysis of Specimen 'A'

5.3 Specimen 'A' is analysed for mass of total tin per kilogram of dry paint (or mass of tin per sample) by applying inductively coupled plasma/mass spectrometry (ICP/MS), once the material had been solubilized by digestion using aqua regia. It should be noted that any other scientifically recognized procedure for tin analysis (such as AAS, XRF and ICP-OES) is acceptable.

Step 2: Characterization of organotin in Specimen 'B'

Analysis of Specimen 'B'

5.4 Should Specimen 'A' produce positive results, organotin compounds should be identified and quantified in Specimen 'B'. Specimen 'B' may be analysed using the following procedure:

.1 solvent extraction of Specimen 'B' as supported by sonication in an ultrasonic bath;

.2 derivatization with ethylmagnesium bromide;

.3 clean-up of the extract;

.4 analysis using high resolution gas chromatography/mass spectrophotometry (GC/MS); and

.5 quantifications using tripropyltin as a standard.

5.5 Any equally reliable method for the chemical identification and quantification of organotin compounds is acceptable.

Case B. Analysis of cybutryne only

5.6 A one-step analysis of 'Specimen C' for determining the amount of cybutryne, using gas chromatography/mass spectrophotometry (GC/MS).

One-step analysis: Characterization of cybutryne in Specimen 'C'

Analysis of Specimen 'C'

5.7 Specimen 'C' should be analysed using the following procedure:

.1 sample extraction using ethyl acetate with added internal standard (ametryn) using an ultrasonic bath for 15 minutes;

.2 ventrifugation of the samples at 600 rcf for 5 minutes;

.3 analysis of the supernatant using high resolution capillary GC/MS, with the MS operating in SIM mode;

.4 quantification using reference cybutryne solutions and an internal standard normalization procedure; and

.5 modified GC/MS methods resulting in an expanded measurement uncertainty (k=2; 95% confidence) of 25% are acceptable.

5.8 Other methods for the chemical identification and quantification of cybutryne, if proven equally reliable, could be accepted by the Administration or the port State.

Case C. simplified approach to detect organotin and cybutryne

5.9 A one-step analysis of Specimen 'C' for determining the amount of organotin and cybutryne using gas chromatography/mass spectrophotometry (GC/MS).

One-step analysis: Characterization of organotin and cybutryne in Specimen 'C'

.1 sample extraction using toluene with added internal standard (ametryn) using an ultrasonic bath for 15 minutes;

.2 derivatization with ethylmagnesium bromide;

.3 clean-up of the extract;

.4 centrifugation of the samples at 600 rcf for 5 minutes;

.5 analysis of the supernatant using high resolution capillary GC/MS, with the MS operating in SIM mode;

.6 cybutryne quantification using reference cybutryne solutions and an internal standard normalization procedure. Organotin quantification using tripropyltin as the internal standard; and

.7 modified GC/MS methods resulting in an expanded measurement uncertainty (k=2; 95% confidence) of 25% are acceptable.

5.10 Other methods for the chemical identification and quantification of organotin and cybutryne, if proven equally reliable, could be accepted by the Administration or the port State.

6 Threshold and tolerance range

6.1 The threshold value for organotin compounds for the brief sampling method as described here is:

"2,500 mg tin (Sn) per kg of dry paint."

6.2 The threshold value for cybutryne for the brief sampling method as described here is:

"1,000 mg of cybutryne per kg of dry paint."

Tolerance range

6.3 The tolerance range is 500 mg Sn / kg of dry paint (20%) in addition to the threshold value.

6.4 The tolerance range is 250 mg cybutryne / kg of dry paint (25%) in addition to the threshold value.

Organotin-containing compounds acting as biocides or catalysts

6.5 As stated in appendix I of resolution MEPC.358(78), for the purposes of defining compliance with Annex 1 to the Convention, it should be noted that small quantities of organotin compounds, acting as chemical catalysts (such as mono- and di-substituted organotin compounds), are allowed, provided they are not acting as a biocide.

6.6 Inorganic impurities in the constituents of the paints should be considered.

6.7 At present neither organotin catalysts nor inorganic impurities are found at concentrations which will be close to the threshold level (2,500 mg Sn/kg of dry paint) or higher. However, organotin-containing compounds, when present in paint in order to act as a biocide, were found in concentrations up to 50,000 mg Sn/kg of dry paint. Thus, the discrimination between anti-fouling systems containing organotin compounds acting as a biocide and anti-fouling systems not containing these compounds or not containing these compounds at concentrations where they act as a biocide is reliably possible.

7 Definition of compliance

7.1 The analytical verification of the compliance will differ depending on the substances targeted as listed in Annex 1 of the AFS Convention.

Case A. Analysis of organotin only
Two-step procedure

7.2 The analytical verification of the compliance with the Convention for organotin compounds is performed in a two-step procedure according to the flow-diagram (diagram B).

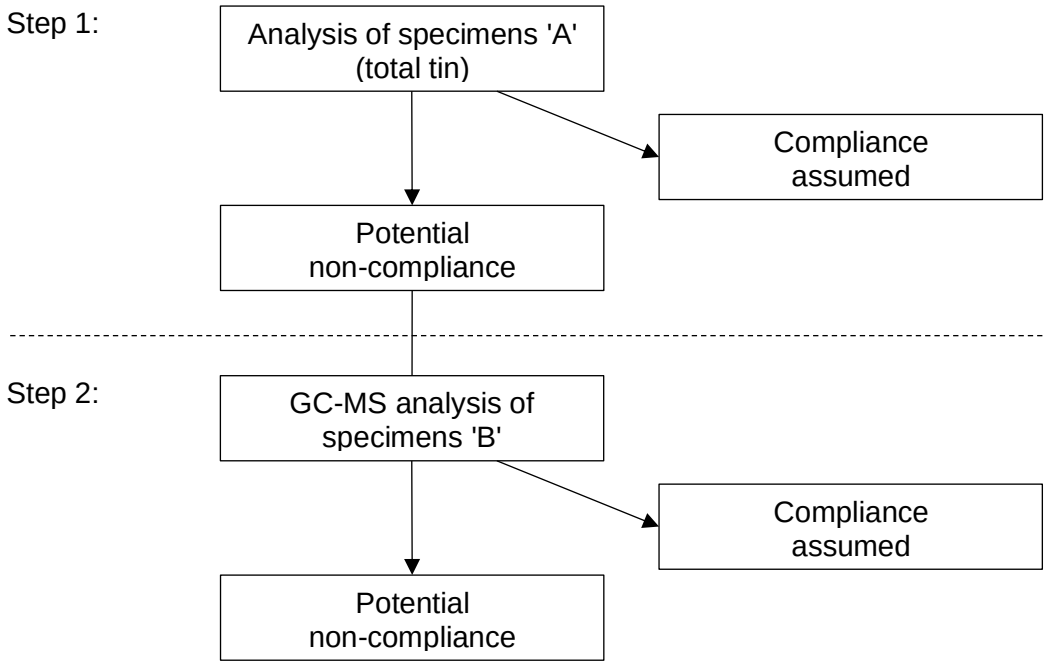


Diagram B: Flow diagram illustrating the two-step analysis procedure for organotin compounds

Compliance with the criteria at the 'Step 1-level'

7.3 Compliance with the Convention is assumed when the results from the specimens 'A', analysed in step 1, meet the following:

.1 no more than 25% of the total number of samples yield results above 2,500 milligrams total tin per kilogram dry paint (2,500 mg Sn/kg of dry paint); and

.2 no sample of the total number of at least eight samples shows a concentration of total tin higher than the sum of threshold value plus the tolerance range, i.e. no sample must exceed the concentration 3,000 mg Sn/kg of dry paint.

7.4 If the results in specimen 'A' indicate that no organotin acting as biocide is present, then performing step 2 is not necessary.

Non-compliance with the criteria at the 'Step 1-level'

7.5 A positive result (non-compliance) is indicated if the provisions of paragraph 7.3 are not met.

7.6 A positive result at step 1 (specimen 'A') would indicate that step 2 should be undertaken, and those samples labelled specimen 'B' should be analysed in order to determine and characterize the organotin present (see diagram B).

Compliance with the criteria at the 'Step 2-level'

7.7 Compliance with the Convention is assumed when the results from the specimens 'B', analysed in step 2, meet the following requirements at the same time:

.1 no more than 25% of the total number of samples yield results above 2,500 milligrams total tin per kilogram dry paint (2,500 mg Sn/kg of dry paint); and

.2 no sample of the total number of at least eight samples shows a concentration of total tin higher than the sum of threshold value plus the tolerance range, i.e. no sample must exceed the concentration 3,000 mg Sn/kg of dry paint.

Non-compliance at 'Step 2-level'

7.8 A positive result in step 2 indicates non-compliance if the provisions of paragraph 7.7 are not met. Such results should be interpreted to mean that organotin compounds are present in the anti-fouling system at a level at which it would act as a biocide.

Case B. Analysis of cybutryne only

7.9 Compliance with the Convention is assumed when the results from specimen 'C', analysed in a one-step analysis for cybutryne, meet the following requirement:

.1 The average value of the total number of specimens shows a concentration below the threshold plus the tolerance range, i.e. 1,250 mg of cybutryne per kg of dry paint.

Non-compliance at the one-step analysis for cybutryne

7.10 An average value of the total number of specimens showing a concentration above the threshold plus the tolerance range, i.e. 1,250 mg of cybutryne per kg of dry paint, indicates non-compliance.

Case C. Simplified approach to detect organotin and cybutryne

7.11 Compliance with the Convention is assumed when the results from specimen 'C', analysed in a one-step analysis for organotin and cybutryne, meet the two conditions below:

.1 for organotin, the average value of the total number of specimens shows a concentration below the threshold plus the tolerance range, i.e. 3,000 mg Sn/kg of dry paint; and

.2 for cybutryne, the average value of the total number of specimens shows a concentration below the threshold plus the tolerance range, i.e. 1,250 mg of cybutryne per kg of dry paint.

Non-compliance at the one-step analysis for organotin and cybutryne

7.12 If one of the conditions set out in paragraph 7.11 above is not met, this indicates non-compliance. Such results should be interpreted to mean that cybutryne or organotin is present in the anti-fouling system at a level at which it would act as a biocide.

APPENDIX TO METHOD 1

RECORD SHEET FOR THE BRIEF SAMPLING PROCEDURE FOR COMPLIANCE WITH THE CONVENTION IN TERMS OF THE PRESENCE OF ORGANOTIN AND/OR CYBUTRYNE ACTING AS A BIOCIDE IN ANTI-FOULING SYSTEMS ON SHIP HULLS

<table>
<tr><td colspan="2">RECORD SHEET:
GUIDELINES FOR BRIEF SAMPLING OF ANTI-FOULING SYSTEMS ON SHIPS – ORGANOTIN AND CYBUTRYNE</td><td>RECORD NUMBER:</td></tr>
<tr><td colspan="3"><u>SECTION 1: Administration</u></td></tr>
<tr><td>1. Country</td><td>2. Name of port</td><td>3. Date</td></tr>
<tr><td colspan="3">4. Reason for sampling
☐ Port State control ☐ Survey & certification ☐ Other flag State compliance inspection</td></tr>
<tr><td colspan="2">5. Company details:
1. Name of ship:
2. Distinctive number or letters:
3. Port of registry
4. Gross tonnage:
5. IMO number:</td><td>6. Inspecting official's details
1. Name:
2. Comments:</td></tr>
<tr><td colspan="3"><u>SECTION 2: Sampling</u></td></tr>
<tr><td colspan="3">1. Time sampling procedure initiated:</td></tr>
<tr><td colspan="3">2. Description of location from where samples were taken (frame number and distance from boot topping, refer to paragraph 3.2):</td></tr>
<tr><td colspan="3">3. Number of samples taken (three or two specimens per sample):</td></tr>
<tr><td colspan="3">4. Photographs taken of the sample point prior to sampling?
☐ Yes ☐ No</td></tr>
<tr><td colspan="3">5. Time sampling procedure completed:</td></tr>
<tr><td colspan="3">6. Additional comments concerning sampling procedure:</td></tr>
</table>

SECTION 3: Analysis and results

Case A. Analysis of organotin only

1. Step 1 total tin analysis:

Company name:

Analyst responsible: Date:

2. Specimen 'A' results: Total number of specimens 'A' analysed:

No.	mg Sn / kg	No.	mg Sn / kg	No.	mg Sn / kg	No.	mg Sn / kg
1		5		9		13	
2		6		10		14	
3		7		11		15	
4		8		12		16	

Number of specimens exceeding 2,500 mg/kg:

1 or more specimens exceeding 3,000 mg/kg: ☐ Yes ☐ No

Conclusion: Step 2 required ☐

Compliance, further analysis unnecessary ☐

3. Additional comments concerning analysis of results from Specimens 'A':

4. Organotin analysis undertaken by:

Company name:

Analyst responsible: Date:

5. Specimen 'B' results: Total number of specimens 'B' analysed:

No.	mg Sn / kg	No.	mg Sn / kg	No.	mg Sn / kg	No.	mg Sn / kg
1		5		9		13	
2		6		10		14	
3		7		11		15	
4		8		12		16	

Number of specimens exceeding 2,500 mg/kg:

1 or more specimens exceeding 3,000 mg/kg: ☐ Yes ☐ No

Conclusion: Non-compliance ☐

Compliance, further analysis unnecessary: ☐

6. Additional comments concerning analysis of results from Specimens 'B':

Case B. Analysis of cybutryne only		
1. A one-step analysis using gas chromatography/mass spectrophotometry (GC/MS) Company name: Analyst responsible: Date:		
2. Specimen 'C' results:		
Total number of specimens 'C' analysed by GC-MS:		
Average concentration of cybutryne (mg of cybutryne per kg of dry paint):		
3. Conclusions:		
The average concentration of cybutryne exceeds the threshold of 1,250 mg of cybutryne per kg of dry paint	☐ Yes	☐ No
4. Additional comments concerning analysis of results from Specimens 'C':		

Case C. Simplified approach to detect organotin and cybutryne		
1. A one-step analysis using gas chromatography/mass spectrophotometry (GC/MS) Company name: Analyst responsible: Date:		
2. Specimen 'C' results:		
Total number of specimens 'C' analysed by GC-MS:		
Average concentration of organotin (mg Sn per kg of dry paint):		
Average concentration of cybutryne (mg of cybutryne per kg of dry paint):		
3. Conclusions:		
The average concentration of organotin exceeds the threshold of 3,000 mg Sn/kg of dry paint	☐ Yes	☐ No
The average concentration of cybutryne exceeds the threshold of 1,250 mg of cybutryne/kg of dry paint	☐ Yes	☐ No
4. Additional comments concerning analysis of results from Specimens 'C':		

SECTION 4: Final conclusion	
Summarized conclusion:	
Compliance with AFS Convention assumed	☐
Non-compliance with AFS Convention assumed	☐

THIS IS TO CERTIFY that this Record is correct in all respects.

Issued at

(Place of issue of Record)

(Date of issue) (Printed name and signature of authorized official issuing the Record)

(Seal or stamp of the authority/organization)

METHOD 2

1 Purpose of this method

1.1 This method provides sampling and analysis procedures to identify the presence of organotin compounds and/or cybutryne in the anti-fouling systems on ships. The method is designed such that the sampling and the first stage analysis could be carried out by ship surveyors or port State control officers (PSCOs) on the survey/inspection site, e.g. at a dry dock.

1.2 The method for organotin compounds is based on a two-stage analysis (case A under paragraph 4.6 of the Guidelines). The first stage detects total tin as an indicator for the presence of organotin and the second stage is necessary only in the case that the first stage analysis providing a positive result to detect specific organotin compounds.

1.3 The method for cybutryne analysis (case B under paragraph 4.6 of the Guidelines) is based on a one-step analysis based on the gas chromatography/mass spectrophotometry analytical method (GC/MS).

1.4 A simplified approach to detect organotin and cybutryne (case C under paragraph 4.6 of the Guidelines) is based on a one-step analysis using the gas chromatography/mass spectrophotometry analytical method (GC/MS).

2 Sampling

2.1 The sampling is carried out by using abrasive paper rubbing on the surface of the anti-fouling system. This results in collection of paint fragments of the anti-fouling system from a thin area, less than several micrometres in depth from the surface, which do not affect the coatings lying underneath such as sealers.

2.2 Abrasive paper is pasted on a disc of approximately 10 mm in diameter. Rubbing the surface of the anti-fouling system with the disc collects several milligrams of the sample on to the abrasive paper.

2.3 The sampling device consists of an electric motor, two (or three) rotating rods on each of which a disc is attached, and a battery for electric power supply. The discs are pressed on to the surface of the ship's hull by spring coils. The discs rotate counter-clockwise while the rods turn clockwise around the centre of the device. A schematic diagram is given in figure 1.

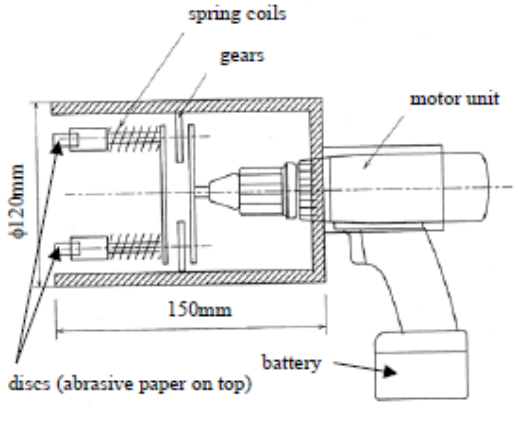


Figure 1. Schematic diagram of sampling device

2.4 A sampling point is selected such that the anti-fouling system is intact over an area of approximately 50 cm x 50 cm or more.

2.5 Depending on the substances targeted as listed in Annex 1 of the AFS Convention:

Case A. For the analysis of organotin only, at each sampling point, three sets of sampling, or more if necessary, should be carried out to obtain at least six specimens.

Case B. For the analysis of cybutryne only, at each sampling point, three sets of sampling, or more if necessary, should be carried out to obtain at least six specimens.

Case C. For the analysis of organotin and cybutryne, at each sampling point, three sets of sampling, or more if necessary, should be carried out to obtain at least six specimens.

2.6 The device is pressed on the ship's hull where it is appropriate to be sampled and held by hand. The electric motor is switched on to slide along the painted surface to lightly scrape off the fragments of the paint onto the abrasive paper. After the sample collection, each disc is removed from the device and stored in an inert container.

2.7 Sampling should normally be carried out with the sampling device. However, in the case that accessibility to the sampling point is poor, it is acceptable to collect samples with the discs by hand if necessary.

3 Analysis

Case A. Analysis of organotin only

3.1 The first-stage analysis

.1 The first-stage analysis is assumed to be carried out on the spot of the survey or inspection, e.g. dry docks and sea ports. In order to accomplish the on-site analysis, X-ray fluorescence analysis (XRF) is used in this method to detect total tin content.

.2 Analytical characteristics, such as detection limit and accuracy, are highly dependent on the type of the instrument, i.e. type of X-ray tube, spectrometer, optical arrangement (filters or collimators), etc. Among several types of the XRF instruments, an energy-dispersive spectrometer with a silicon drift detector (SDD), which is compact in size and able to be operated without liquid nitrogen, is preferable to the present analytical system for a field use, whereas wave-length dispersion system or solid-state detector are also available if the analysis is carried out at laboratories.

.3 Software customized for the tin analysis is prepared to assist the operator, who is assumed to be a ship surveyor or PSCO, to detect total tin in the specimens.

.4 The customized software may in advance need a calibration curve of the characteristic X-ray intensity of tin in relation to the tin content particularly in the range of 0.1 to 0.5%.

.5 After the preparation including the warming-up of the XRF instrument and starting-up of the computer, a specimen (sampling disc) is placed on the sample stage of the instrument. Afterwards, analysis is executed by the customized software. A single batch of analysis for one specimen normally takes five minutes and the result is shown on a display automatically.

6. Since the XRF analysis does not affect any properties of the specimens, all of the collected specimens (six to nine specimens), including those for the second analysis and storage, are able to be used for this analysis.

3.2 Interpretation of the result at the first-stage analysis

.1 Following the procedures above, XRF data of six, or nine, specimens are obtained for each sampling point. Omitting the maximum and minimum values from the data, an average of the tin content is calculated from the intermediate values for the representing value of the sampling point.

.2 Compliance with the Convention is assumed when none of the tin contents (average values) from the samples do not exceed the sum of the threshold (2,500 mg per kg) and a tolerance (500 mg per kg).

.3 When one or more average values of samples from different sampling points do not meet the above criteria, the samples should be sent to a laboratory for the second stage analysis. Regardless of the results, it is also possible to undergo the second stage analysis when the surveyor or PSCO considers that it is necessary to do so.

3.3 Second-stage analysis

.1 Since the second-stage analysis provides the final and definitive results of the samples, the method should be thoroughly reviewed by experts based on scientific evidence. The following is a brief summary of a tentative methodology for the second stage analysis.

.2 The collected paint specimens are removed from the abrasive paper and total mass is measured with an electronic balance to an order of 0.1 mg. The specimens are hydrolysed with sodium hydroxide aqueous solution, extracted with organic solvent, and then derivatized with propylmagnesium bromide. After cleaning up the extract, analysis using high resolution gas chromatography/mass spectrometry (GC/MS) is carried out. For quantification analysis, tetrabutyl tin d36 is added as the internal standard.

.3 These analyses provide the data of chemical species and their content (mg per kg of the specimens). The content of organotin is obtained in a unit of mg per kg of dry paint.

Case B. For the analysis of cybutryne only

3.4 The collected paint specimens are removed from the abrasive paper and total mass is measured with an electronic balance to an order of 0.1 mg. The following procedure is proposed for determining the concentration of cybutryne:

.1 sample extraction using ethyl acetate with added internal standard (ametryn) using an ultrasonic bath for 15 minutes;

.2 centrifugation of the samples at 600 rcf for 5 minutes;

.3 analysis of the supernatant using high resolution capillary GC/MS, with the MS operating in SIM mode;

.4 quantification using reference cybutryne solutions and an internal standard normalization procedure; and

.5 modified GC/MS methods resulting in an expanded measurement uncertainty (k=2; 95% confidence) of 25% are acceptable.

Case C. Simplified approach to detect organotin and cybutryne

3.5 The collected paint specimens are removed from the abrasive paper and total mass is measured with an electronic balance to an order of 0.1 mg. The following procedure is proposed for determining the concentration of organotin and cybutryne:

.1 sample extraction using toluene with added internal standard (ametryn) using an ultrasonic bath for 15 minutes;

.2 addition of sodium hydroxide aqueous solution to hydrolyse the sample and to facilitate the extraction to the toluene;

.3 centrifugation of the samples at 600 rcf for 5 minutes;

.4 collection of the supernatant and derivatization with propylmagnesium bromide;

.5 clean-up of the extract;

.6 analysis of the toluene solution using high resolution capillary GC/MS, with the MS operating in SIM mode;

.7 cybutryne quantification using reference cybutryne solutions and an internal standard normalization procedure; organotin quantification using tetrabutyl tin d36 is added as the internal standard; and

.8 modified GC/MS methods resulting in an expanded measurement uncertainty (k=2; 95% confidence) of 25% are acceptable.

4 Compliance with the Convention

Case A. Analysis of organotin only

4.1 Compliance with the Convention for organotin compounds is assumed when the results from the second-stage analysis meet the following requirements at the same time:

.1 no more than 25% of the total number of samples yield results above 2,500 milligrams tin as organic form per kilogram dry paint (2,500 mg Sn/kg of dry paint); and

.2 no sample of the total number of specimens shows a concentration of tin as organic form higher than the sum of the threshold value plus the tolerance range, i.e. no sample must exceed the concentration 3,000 mg Sn/kg dry paint.

4.2 When the result does not meet the above criteria, it is interpreted to mean that organotin compounds are present in the anti-fouling system at a level where they would act as a biocide.

Case B. Analysis of cybutryne only

4.3 Compliance with the Convention for cybutryne is assumed when the results from the cybutryne analysis meet the following criterion:

.1 the average value of the total number of specimens shows a concentration below the threshold plus the tolerance range, i.e. 1,250 mg of cybutryne per kg of dry paint.

4.4 When the result does not meet the above criterion, it is interpreted to mean that cybutryne is present in the anti-fouling system at a level where it would act as a biocide.

Case C. Simplified approach to detect organotin and cybutryne

4.5 Compliance with the Convention for organotin compounds and cybutryne is assumed when the results from the cybutryne and organotin analysis meet the two conditions below:

.1 for organotin, the average value of the total number of specimens shows a concentration below the threshold plus the tolerance range i.e. 3,000 mg Sn/kg of dry paint; and

.2 for cybutryne, the average value of the total number of specimens shows a concentration below the threshold plus the tolerance range, i.e. 1,250 mg of cybutryne per kg of dry paint.

4.6 When the results do not meet one of the conditions above, it is interpreted to mean that organotin compounds or cybutryne are present in the anti-fouling system at a level where they would act as a biocide.

APPENDIX TO METHOD 2

RECORD SHEET FOR THE SAMPLING AND ANALYSIS OF ANTI-FOULING SYSTEMS ON SHIP HULLS – ORGANOTIN COMPOUNDS AND/OR CYBUTRYNE

		Record number:
Section 1: Administration		
1. Country		2. Location
3. Date		
4. Reason for survey/inspection		
5. Details of the ship		
	5.1 Name of ship	
	5.2 Distinctive number or letters	
	5.3 Gross tonnage	5.4. Year of build
	5.5 Owner or operator of ship	
	5.6 Flag State	5.7 Class of ship
	5.8 Authority of AFS certificate	
	5.9 Date of issue	
	5.10 Date of last endorsement	
	5.11 IMO number	
	5.12 Name of shipmaster	
	5.13 Product name of anti-fouling system	
	5.14 Name of manufacturer	
	5.15 Name of shipyard where applied	
	5.16 Comments	
6. Inspecting official's details		
	6.1 Name	
	6.2 Comments	

Section 2: Sampling and analysis

Case A. Analysis of organotin only

	Record number
Sampling and Stage 1 analysis (X-ray fluorescence analysis)	
Date:	**Instrument I.D.**

Sample location	**Specimen I.D.**	**Sample disc**	**Content of tin (mg/ kg)**	**max**	**min**	**Average**
A	A1	☐ abrasive				
	A2	☐ metal				
	A3	☐ others				Average
	A4	☐ abrasive				
	A5	☐ metal				mg/kg
	A6	☐ others				☐>2,500 mg/kg
	A7	☐ abrasive				☐>3,000 mg/kg
	A8	☐ metal				
	A9	☐ others				
B	B1	☐ abrasive				
	B2	☐ metal				
	B3	☐ others				Average
	B4	☐ abrasive				
	B5	☐ metal				mg/kg
	B6	☐ others				☐>2,500 mg/kg
	B7	☐ abrasive				☐>3,000 mg/kg
	B8	☐ metal				
	B9	☐ others				
C	C1	☐ abrasive				
	C2	☐ metal				
	C3	☐ others				Average
	C4	☐ abrasive				
	C5	☐ metal				mg/kg
	C6	☐ others				☐>2,500 mg/kg
	C7	☐ abrasive				☐>3,000 mg/kg
	C8	☐ metal				
	C9	☐ others				
D	D1	☐ abrasive				
	D2	☐ metal				
	D3	☐ others				Average
	D4	☐ abrasive				
	D5	☐ metal				mg/kg
	D6	☐ others				☐>2,500 mg/kg
	D7	☐ abrasive				☐>3,000 mg/kg
	D8	☐ metal				
	D9	☐ others				

☐ Stage 2 required	☐ ___samples out of___ are above 2,500 mg/kg ☐sample(s)___is (are) above 3,000 mg/kg	☐Compliant
Sampled by	Analysed by	
Signature	Signature	

	Record number:

Stage 2 analysis (Gas chromatography/mass spectrometry)				
Date				
Instrument I.D.				
Comments on the method				
Sample I.D.	Specimen used	Content of tin (XFR analysis) (mg/kg)	Content of tin (as organotin) (mg/kg)	Compliance
A				☐>2,500 mg/kg ☐>3,000 mg/kg
B				☐>2,500 mg/kg ☐>3,000 mg/kg
C				☐>2,500 mg/kg ☐>3,000 mg/kg
D				☐>2,500 mg/kg ☐>3,000 mg/kg
4. Conclusion ☐ Not compliant _____ samples out of _____are above 2,500 mg/kg sample(s)_____is (are) above 3,000 mg/kg ☐Compliant				
5. Additional comments				
6. Laboratory name				
7. Analysed by		8. Signature		

Case B. Analysis of cybutryne only

	Record number
Sampling and gas chromatography/mass spectrometry analysis	
Date:	**Instrument I.D.**

Sample location	Specimen I.D.	Sample disc	Comments on the samples and sampling procedure	Comments on the sample location
A	A1	☐ abrasive		
	A2	☐ metal		
	A3	☐ others		
	A4	☐ abrasive		
	A5	☐ metal		
	A6	☐ others		
	A7	☐ abrasive		
	A8	☐ metal		
	A9	☐ others		
B	B1	☐ abrasive		
	B2	☐ metal		
	B3	☐ others		
	B4	☐ abrasive		
	B5	☐ metal		
	B6	☐ others		
	B7	☐ abrasive		
	B8	☐ metal		
	B9	☐ others		
C	C1	☐ abrasive		
	C2	☐ metal		
	C3	☐ others		
	C4	☐ abrasive		
	C5	☐ metal		
	C6	☐ others		
	C7	☐ abrasive		
	C8	☐ metal		
	C9	☐ others		
D	D1	☐ abrasive		
	D2	☐ metal		
	D3	☐ others		
	D4	☐ abrasive		
	D5	☐ metal		
	D6	☐ others		
	D7	☐ abrasive		
	D8	☐ metal		
	D9	☐ others		

Average concentration of cybutryne (mg of cybutryne per kg of dry paint)	
Sampled by	Analysed by
Signature	Signature

Case C. Simplified approach to detect organotin and cybutryne

	Record number
Sampling and gas chromatography/mass spectrometry analysis	
Date:	**Instrument I.D.**

Sample location	Specimen I.D.	Sample disc	Comments on the samples and sampling procedure	Comments on the sample location
A	A1	☐ abrasive		
	A2	☐ metal		
	A3	☐ others		
	A4	☐ abrasive		
	A5	☐ metal		
	A6	☐ others		
	A7	☐ abrasive		
	A8	☐ metal		
	A9	☐ others		
B	B1	☐ abrasive		
	B2	☐ metal		
	B3	☐ others		
	B4	☐ abrasive		
	B5	☐ metal		
	B6	☐ others		
	B7	☐ abrasive		
	B8	☐ metal		
	B9	☐ others		
C	C1	☐ abrasive		
	C2	☐ metal		
	C3	☐ others		
	C4	☐ abrasive		
	C5	☐ metal		
	C6	☐ others		
	C7	☐ abrasive		
	C8	☐ metal		
	C9	☐ others		
D	D1	☐ abrasive		
	D2	☐ metal		
	D3	☐ others		
	D4	☐ abrasive		
	D5	☐ metal		
	D6	☐ others		
	D7	☐ abrasive		
	D8	☐ metal		
	D9	☐ others		

Average content of organotin (mg of organotin per kg of dry paint)	

Average concentration of cybutryne (mg of cybutryne per kg of dry paint)	
Sampled by	Analysed by
Signature	Signature

Section 3: Final conclusion
1. Conclusion ☐ Anti-fouling system is compliant with the AFS Convention 2001. ☐ Anti-fouling system is NOT compliant with the AFS Convention 2001.
2. Comments
3. Processed official 3.1 Name 3.2 Date 3.3 Signature
4. Authorized administrator 4.1 Name 4.2 Date 4.3 Signature

***

Annex 20

Resolution MEPC.357(78)

(adopted on 10 June 2022)

2022 Guidelines for Inspection of Anti-fouling Systems on Ships

ANNEX 20

RESOLUTION MEPC.357(78)
(adopted on 10 June 2022)

2022 GUIDELINES FOR INSPECTION OF ANTI-FOULING SYSTEMS ON SHIPS

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee conferred upon it by international conventions for the prevention and control of marine pollution,

RECALLING ALSO that the International Conference on the Control of Harmful Anti- fouling Systems for Ships, 2001, held in October 2001, adopted the International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001 (the AFS Convention) together with four Conference resolutions,

RECALLING FURTHER that article 11(1) of the AFS Convention prescribes that ships to which this Convention applies may, in any port, shipyard, or offshore terminal of a Party, be inspected by officers authorized by that Party for the purpose of determining whether the ship is in compliance with this Convention,

NOTING that article 3(3) of the AFS Convention prescribes that Parties to this Convention shall apply the requirements of this Convention as may be necessary to ensure that no more favourable treatment is given to ships of non-Parties to this Convention,

NOTING ALSO resolution MEPC.208(62) by which the Committee adopted the 2011 Guidelines for Inspection of Anti-fouling Systems on Ships,

RECALLING FURTHER that at its seventy-sixth session it adopted amendments to the AFS Convention to introduce controls on cybutryne through resolution MEPC.331(76),

RECOGNIZING the need for a consequential revision of the guidelines associated with the AFS Convention due to the aforementioned amendments,

NOTING FURTHER that through resolutions MEPC.358(78) and MEPC.356(78) the Organization adopted *2022 Guidelines for survey and certification of anti-fouling systems on ships* and *2022 Guidelines for brief sampling of anti-fouling systems on ships*, respectively, and

HAVING CONSIDERED a revised text of the *Guidelines for inspection of anti-fouling systems on ships* prepared by the Sub-Committee on Pollution Prevention and Response at its ninth session,

1 ADOPTS the *2022 Guidelines for inspection of anti-fouling systems on ships* (2022 Guidelines), the text of which is set out in the annex to this resolution;

2 INVITES Governments to apply the 2022 Guidelines when exercising port State control inspections;

3 RECOMMENDS that the 2022 Guidelines incorporated in the future revision of resolution A.1155(32) on *Procedures for port State control, 2021*;

4 RECOMMENDS that the Guidelines be reviewed on a regular basis;

5 REVOKES resolution MEPC.208(62).

ANNEX

2022 GUIDELINES FOR INSPECTION OF ANTI-FOULING SYSTEMS ON SHIPS

1 INTRODUCTION

1.1 The right of the port State to conduct inspections of anti-fouling systems on ships is laid down in article 11 of the AFS Convention. The guidelines for conducting these inspections are described below.

1.2 Ships of 400 gross tonnage and above engaged in international voyages (excluding fixed or floating platforms, FSUs and FPSOs) will be required to undergo an initial survey before the ship is put into service or before the International Anti-fouling System Certificate (IAFS) is issued for the first time; and a survey should be carried out when the anti-fouling systems are changed or replaced.

1.3 Ships of 24 metres in length or more but less than 400 gross tonnage engaged in international voyages (excluding fixed or floating platforms, FSUs and FPSOs) will have to carry a Declaration on Anti-fouling Systems signed by the owner or authorized agent. Such declaration shall be accompanied by appropriate documentation (such as a paint receipt or a contractor invoice) or contain appropriate endorsement.

2 INITIAL INSPECTION

2.1 Ships required to carry an IAFS Certificate or Declaration on Anti-Fouling Systems (Parties of the AFS Convention)

2.1.1 The PSCO should check the validity of the IAFS Certificate or Declaration on Anti-Fouling Systems, and the attached Record of Anti-Fouling Systems, if appropriate.

2.1.2 The only practical way to apply paint to the ship's bottom (underwater part) is in a dry dock. This means that the date of application of paint on the IAFS Certificate should be checked by comparing the period of dry-docking with the date on the certificate.

2.1.3 If the paint has been applied during a scheduled dry-dock period, it has to be registered in the ship's logbook. Furthermore, this scheduled dry-docking can be verified by the endorsement date on the (statutory) Cargo Ship Safety Construction Certificate or the Cargo Ship Safety Certificate (SOLAS, regulation I/12(a)(v)) and Passenger Ship Safety Certificate (SOLAS, regulation I/7).

2.1.4 In case of an unscheduled dry-dock period, it could be verified by the registration in the ship's logbook.

2.1.5 It can be additionally verified by the endorsement date on the (Class) Hull Certificate, the dates on the Manufacturer's Declaration or by confirmation of the shipyard.

2.1.6 The IAFS Certificate includes a series of tick boxes indicating for each of the anti-fouling systems, describing the following situations:

.1 if an anti-fouling system controlled under Annex 1 to the AFS Convention has not been applied during or after construction of this ship;

.2 if an anti-fouling system controlled under Annex 1 to the AFS Convention has been applied on this ship previously, but has been removed;

.3 if an anti-fouling system controlled under Annex 1 to the AFS Convention has been applied on this ship previously, but has been covered with a sealer coat;

.4 if an anti-fouling system controlled under Annex 1 of the AFS Convention has been applied on this ship previously, but is not in the external coating layer of the hull or external parts or surfaces on 1 January 2023 (not applicable for organotin); and

.5 if an anti-fouling system controlled under Annex 1 of the AFS Convention was applied on this ship prior to 1 January 2023, but must be removed or covered with a sealer coat no later than 60 months following the last application to the ship of an anti-fouling systems containing cybutryne (not applicable for organotin).

2.1.7 Particular attention should be given to verifying that the survey for issuance of the current IAFS Certificate matches the dry-dock period listed in the ship's log(s)[1] and that only one tick box is marked for each of the substances controlled under Annex 1.

2.1.8 The Record of Anti-Fouling Systems should be attached to the IAFS Certificate and be up to date. The most recent record should agree with the tick box on the front of the IAFS Certificate. The issuing of the IAFS Certificate should be in accordance with regulation 2(3) of Annex 4 of the AFS Convention.

2.2 Ships of non-Parties to the AFS Convention

2.2.1 Ships of non-Parties to the AFS Convention are not entitled to be issued with an IAFS Certificate. Therefore, the PSCO should ask for documentation that contains the same information as in an IAFS Certificate and take this into account in determining compliance with the requirements.

2.2.2 If the existing anti-fouling system is declared not to be controlled under Annex 1 to the Convention, without being documented by an International Anti-Fouling System Certificate, verification should be carried out to confirm that the anti-fouling system complies with the requirements of the Convention. This verification may be based on sampling and/or testing and/or reliable documentation, as deemed necessary, based on experience gained and the existing circumstances. Documentation for verification could be, for example, MSDS (Material Safety Data Sheets), or similar, a declaration of compliance from the anti-fouling system manufacturer, invoices from the shipyard and/or the anti-fouling system manufacturer.

2.2.3 Ships of non-Parties may have Statements of Compliance issued in order to comply with regional requirements, for example, Regulation (EC) 782/2003 as amended by Regulation (EC) 536/2008, which could be considered as providing sufficient evidence of compliance for organotin compounds.

2.2.4 In all other aspects the PSCO should be guided by the procedures for ships required to carry an IAFS Certificate.

[1] This provision, regarding the matching of the survey with the dry-dock period, is not applicable for the survey referred to in operative paragraph 4 of resolution MEPC.331(76).

2.2.5 The PSCO should ensure that no more favourable treatment is applied to ships of non-Parties to the AFS Convention.

3 MORE DETAILED INSPECTION

3.1 Clear grounds

3.1.1 A more detailed inspection may be carried out when there have been clear grounds to believe that the ship does not substantially meet the requirements of the AFS Convention. Clear grounds for a more detailed inspection may be when:

.1 the ship is from a flag of a non-Party to the Convention and there is no AFS documentation;

.2 the ship is from a flag of a Party to the Convention but there is no valid IAFS Certificate;

.3 the painting date shown on the IAFS Certificate does not match the dry-dock period of the ship;

.4 the ship's hull shows excessive patches of different paints; and

.5 the IAFS Certificate is not properly completed.

3.1.2 If the IAFS Certificate is not properly completed, the following questions may be pertinent:

.1 "When was the ship's anti-fouling system last applied?";

.2 "If the anti-fouling system is controlled under Annex 1 to the AFS Convention and was removed, what was the name of the facility and date of the work performed?";

.3 "If the anti-fouling system is controlled under Annex 1 to the AFS Convention and has been covered by a sealer coat, what was the name of the facility and date applied?";

.4 "What is the name of the anti-fouling/sealer products and the manufacturer or distributor for the existing anti-fouling system?"; and

.5 "If the current anti-fouling system was changed from the previous system, what was the type of anti-fouling system and name of the previous manufacturer or distributor?".

3.2 Sampling

3.2.1 A more detailed inspection may include sampling and analysis of the ship's anti-fouling system, if necessary, to establish whether or not the ship complies with the AFS Convention. Such sampling and analysis may involve the use of laboratories and detailed scientific testing procedures.

3.2.2 If sampling is carried out, the time to process the samples cannot be used as a reason to delay the ship.

3.2.3 Any decision to carry out sampling should be subject to practical feasibility or to constraints relating to the safety of persons, the ship or the port (see appendix 1 for sampling procedures; an AFS Inspection Report template for sampling and analysis is attached to the Guidelines).

3.3 Action taken under the AFS Convention

Detention

3.3.1 The port State could decide to detain the ship following detection of deficiencies during an inspection on board.

3.3.2 Detention could be appropriate in any of the following cases:

.1 certification is invalid or missing;

.2 the ship admits it does not comply (thereby removing the need to prove by sampling); and

.3 sampling proves it is non-compliant within the port's jurisdiction.

3.3.3 Further action would depend on whether the problem is with the certification or the anti-fouling system itself.

3.3.4 If there are no facilities in the port of detention to bring the ship into compliance, the port State could allow the ship to sail to another port to bring the anti-fouling system into compliance. This would require an agreement of that port.

Dismissal

3.3.5 The port State could dismiss the ship, meaning that the port State demands that the ship leave port – for example if the ship chooses not to bring the AFS into compliance but the port State is concerned that the ship is leaching tributyltin (TBTs) or cybutryne into its waters.

3.3.6 Dismissal could be appropriate if the ship admits it does not comply or sampling proves it is non-compliant while the ship is still in port. Since this would also be a detainable deficiency the PSCO can detain first and require rectification before release. However, there may not be available facilities for rectification in the port of detention. In this case the port State could allow the ship to sail to another port to bring the anti-fouling system into compliance. This could require the agreement of that port.

3.3.7 Dismissal could be appropriate in any of the following cases:

.1 certification is invalid or missing;

.2 the ship admits it does not comply (thereby removing the need to collect proof by sampling); and

.3 sampling proves that the ship is non-compliant within the port's jurisdiction.

3.3.8 In these cases the ship will probably already have been detained. However, detention does not force the ship to bring the AFS into compliance (only if it wants to depart). In such a situation the port State may be concerned that the ship is leaching TBTs or cybutryne while it remains in its waters.

Exclusion

3.3.9 The port State could decide to exclude the ship to prevent it entering its waters. Exclusion could be appropriate if sampling proves that the ship is non-compliant but the results have been obtained after it has sailed or after it has been dismissed.

3.3.10 Exclusion could be appropriate if sampling proves that the ship is non-compliant but the results have been obtained after it has sailed or after it has been dismissed. Article 11(3) of the AFS Convention only mentions that the "party carrying out the inspection" may take such steps. This means that, if a port State excludes a ship, the exclusion cannot be automatically applied by other port States.

3.3.11 In accordance with the Procedures for Port State Control (resolution A.1155(32), as amended), where deficiencies cannot be remedied at the port of inspection, the PSCO may allow the ship to proceed to another port, subject to any appropriate conditions determined. In such circumstances, the PSCO should ensure that the competent authority of the next port of call and the flag State are notified.

Reporting to the flag State

3.3.12 Article 11(3) of the AFS Convention requires that, when a ship is detained, dismissed or excluded from a port for violation of the Convention, the Party taking such action shall immediately inform the flag Administration of the ship and any recognized organization which has issued a relevant certificate.

4 AFS REPORT TO FLAG STATE IN RESPONSE TO ALLEGED CONTRAVENTIONS

4.1 Article 11(4) of the AFS Convention allows Parties to inspect ships at the request of another Party, if sufficient evidence that the ship is operating or has operated in violation of the Convention is provided. Article 12(2) permits port States conducting the inspection to send the Administration (flag State) of the ship concerned any information and evidence it has that a violation has occurred. Information sent to the flag State is often inadequate for a prosecution. The following paragraphs detail the sort of information needed.

4.2 The report to the authorities of the port or coastal State should include as much as possible the information listed in section 3. The information in the report should be supported by facts which, when considered as a whole, would lead the port or coastal State to believe a contravention had occurred.

4.3 The report should be supplemented by documents such as:

.1 the port State report on deficiencies;

.2 a statement by the PSCO, including their rank and organization, about the suspected non-conforming anti-fouling system. In addition to the information required in section 3, the statement should include the grounds the PSCO had for carrying out a more detailed inspection;

.3 a statement about any sampling of the anti-fouling system including:

.1 the ship's location;

.2 where the sample was taken from the hull, including the vertical distance from the boot topping;

.3 the time of sampling;

.4 person(s) taking the samples; and

.5 receipts identifying the persons having custody and receiving transfer of the samples;

.4 reports of the analyses of any samples including:

.1 the results of the analyses;

.2 the method employed;

.3 reference to or copies of scientific documentation attesting the accuracy and validity of the method employed;

.4 the names of persons performing the analyses and their experience; and

.5 a description of the quality assurance measures of the analyses;

.5 statements of persons questioned;

.6 statements of witnesses;

.7 photographs of the hull and sample areas; and

.8 a copy of the IAFS Certificate, including copies of relevant pages of the Record of Anti-fouling Systems, logbooks, MSDS or similar, declaration of compliance from the anti-fouling system manufacturer, invoices from the shipyard and other dry dock records pertaining to the anti-fouling system.

4.4 All observations, photographs and documentation should be supported by a signed verification of their authenticity. All certifications, authentications or verifications should be in accordance with the laws of the State preparing them. All statements should be signed and dated by the person making them, with their name printed clearly above or below the signature.

4.5 The reports referred to under paragraphs 2 and 3 of this section should be sent to the flag State. If the coastal State observing the contravention and the port State carrying out the investigation on board are not the same, the port State carrying out the investigation should also send a copy of its findings to the coastal State.

APPENDIX 1

SAMPLING

Considerations related to brief sampling may be found in section 2.1 of the *Guidelines for brief sampling of anti-fouling systems on ships* (resolution MEPC.356(78)).

Any obligation to take a sample should be subject to practical feasibility or to constraints relating to the safety of persons, the ship or the port.

The PSCO should consider the following:

- liaise with the ship on the location and time needed to take samples; the PSCO should verify that the time required will not unduly prevent the loading/unloading, movement or departure of the ship;

- do not expect the ship to arrange safe access but liaise with the ship over the arrangements that the port State competent authority has made, for example boat, cherry picker, staging;

- select sampling points covering representative areas;

- take photographs of the hull, sample areas and sampling process;

- avoid making judgements on the quality of the paint (e.g. surface, condition, thickness, application);

- the need of inviting the ship representative's presence during brief sampling to ensure that the evidence is legally obtained;

- complete and sign the inspection report form together with the included sampling record sheets (to be filled in by the sampler), as far as possible, and leave a copy with the ship as a proof of inspection/sampling;

- inform the next port State where the inspected ship is to call;

- agree with or advise the ship on to whom the ship's copy of the finalized inspection report will be sent in cases when it cannot be completed in the course of the inspection; and

- ensure that receipts identifying the persons having custody and receiving transfer of the samples accompany the samples are filled in to reflect the transfer chain of the samples. PSCOs are reminded that the procedures set in national legislation regarding custody of evidence are not affected by the regulation. These guidelines therefore do not address this issue in detail.

1 Sampling methodologies

It is at the discretion of the port State to choose the sampling methodology. The *Guidelines for brief sampling of anti-fouling systems on ships* adopted by resolution MEPC.356(78) allow that any other scientifically recognized method of sampling and analysis of AFS controlled under the Convention than those described in the appendix to the Guidelines may be used (subject to the satisfaction of the Administration or the port State). The sampling methodology will depend, inter alia, on the surface hardness of the paint, which may vary considerably. The amount of paint mass removed may vary correspondingly.

Based on the onboard International Anti-fouling System Certificate or a Declaration on Anti-fouling System, the port State competent authority would decide if the brief sampling analysis should focus on only organotin, cybutryne or both and apply the appropriate methodology including the number of samples, analysis, and definition of compliance.

Sampling procedures, based on the removal of paint material from the hull, require the determination of paint mass. It is important that procedures used are validated, produce unambiguous results and contain an adequate control.

The competent port State authority can decide to contract specialist companies to carry out sampling. In this case the PSCO should attend the ship during the sampling procedure to ensure the liaison and arrangements mentioned above are in place.

If a specialist company is not used, the port State competent authority should provide appropriate training to the PSCO in the available sampling methods and procedures and ensure that agreed procedures are followed.

The following general terms should be observed:

- the PSCO should choose a number of sample points preferably covering all the representative areas of the hull, but it is desirable to have at least eight (8) sample points equally spaced down and over the length of the hull, if possible divided over PS and SB (keeping in mind that different parts of the hull may be treated with different anti-fouling systems);

- triplicate specimens of paint at each sampling point should be taken in close proximity to each other on the hull (e.g. within 10 cm of each other);

- contamination of the samples should be avoided, which normally includes the wearing of non-sterilized non-powdered disposable gloves of suitable impervious material – e.g. nitrile rubber;

- the samples should be collected and stored in an inert container (e.g. containers should not consist of materials containing organotins and cybutryne or have the capacity to absorb organotins and cybutryne);

- samples should be taken from an area where the surface of the anti-fouling system is intact, clean and free of fouling;

- loose paint chips coming from detached, peeled or blistered hull areas should not be used for sampling;

- samples should not be taken from a heated or area where the paint is otherwise softened (e.g. heavy fuel tanks);

- the underlying layers (primers, sealers, TBT containing AFS) should not be sampled if there is no clear evidence of exposure of extended areas; and

- ships bearing an anti-fouling system that does not contain cybutryne in the external coating layer are not required to be controlled under Annex 1 of the Convention. Such ships carrying an IAFS Certificate indicating the situation described in paragraph 2.1.6.4 of these Guidelines should be deemed compliant with the Convention except if there is a doubt on the validity of the IAFS Certificate.

2 Validity of the sampling

In order to safeguard the validity of the sampling as evidence of non-compliance, the following should be considered:

- only samples taken directly from the hull and free of possible contamination should be used;

- all samples should be stored in containers, marked and annotated on the record sheet. This record sheet should be submitted to the Administration;

- the receipts identifying the persons having custody and receiving transfer of the samples should be filled in and accompany the samples to reflect the transfer chain of the samples;

- the PSCO should verify the validity of the instrument's calibration validity date (according to the manufacturer instruction);

- in cases when a contracted specialist company is used for carrying out sampling, the PSCO should accompany its representative to verify sampling; and

- photographs of the hull, sample areas and sampling process could serve as additional proof.

It is also the case that sampling companies and/or procedures can be certified.

3 Health and safety when sampling

Any obligation to take a sample should be subject to practical feasibility or any constraints relating to the safety of persons, the ship or the port.

The PSCO is advised to ensure their safety taking the following points into account:

- general requirements enforced by the terminal or port authority and national health, safety and environmental policy;

- condition of the ship (ballast condition, ship's operations, mooring, anchorage, etc.);

- surroundings (position of ship, traffic, ships movement, quay operations, barges or other floating vessels alongside);

- safety measures for the use of access equipment (platforms, cherry picker, staging, ladders, railings, climbing harness, etc.), e.g. ISO 18001;

- weather (sea state, wind, rain, temperature, etc.); and

- precautions to avoid falling into the water between the quay and the ship. If in doubt, a lifejacket and if possible a safety line should be worn when sampling.

Any adverse situation encountered during sampling that could endanger the safety of personnel shall be reported to the safety coordinator.

Care should be taken to avoid contact of the removed paint with the skin and the eyes, and no particles should be swallowed or come into contact with foodstuffs. Eating or drinking during sampling is prohibited and hands should be cleaned afterwards. Persons carrying out sampling should be aware that the AFS and solvents or other materials used for sampling may be harmful and appropriate precautions should be taken. Personal protection should be considered by using long sleeve solvent-resistant gloves, dust mask, safety glasses, etc.

Standard (and specific, if applicable) laboratory safety procedures should be followed at all times when undertaking the sampling procedures and subsequent analysis.

4 Conducting analyses

The *Guidelines for brief sampling of anti-fouling systems on ships* envisage a two-stage analysis for organotin analysis for both methods presented in the appendix to the Guidelines. The first stage is a basic test, which can be carried out on site as in the case of Method 2. The second stage is carried out when the first stage results are positive. It is noted that in the IMO Guidelines these stages are referred to as Steps 1 and 2 as in the case of Method 1. It is at the discretion of the port State competent authorities to choose which analysis methods are used.

The method for cybutryne determination is based on a one-step analysis.

The following points are presented for port State consideration:

- approval procedure for the recognition of laboratories meeting ISO 17025 standards or other appropriate facilities should be set up by the port State competent authorities. These procedures should define the recognition criteria. Exchange of information between port States on these procedures, criteria and laboratories/facilities would be beneficial, i.e. for the purposes of exchange of best practices and possible cross-border recognition and provision of services;

- the company that undertakes the analysis and/or samples should comply with national regulations and be independent from paint manufacturers;

- the PSCO carrying out the AFS inspection of a ship should verify the validity of the ISO 17025 certificate and/or the recognition of the laboratory;

- if more time is needed for analysis than available considering the ship's scheduled time of departure, the PSCO shall inform the ship and report the situation to the port State competent authority. However, the time needed for analysis does not warrant undue delay of the ship; and

- PSCOs should ensure completion of the record sheets for the sampling procedure as proof of analysis. In cases when the laboratory procedures prescribe presentation of the analyses' results in a different format, this technical report could be added to the record sheets.

5 The first-stage analysis for organotin

The first-stage analysis serves to detect the total amount of tin in the AFS applied.

It is at the discretion of the port State competent authority to choose the first-stage analysis methodology. However, the use of a portable X-ray fluorescence analyser (mentioned under

Method 2) or any other scientifically justified method allowing the conduction of first-stage analyses on site could be considered best practice.

The port State competent authority has to decide whether the first-stage analysis should be carried out by PSCOs or by contracted companies.

The port State competent authority could provide PSCOs with this equipment (e.g. portable X-ray fluorescence analyser) and provide the appropriate training.

6 The second-stage analysis for organotin

The second-stage (final) analysis is used to verify whether or not the AFS system complies with the Convention requirements, i.e. whether organotin compounds are present in the AFS at a level which would act as a biocide.

The port State could consider implementing only a second-stage analysis.

It is at the discretion of the Authority to choose the second-stage analysis methodology. In this respect it is hereby noted that the second-stage analysis methodology for sampling Method 2 provided in the Guidelines is only tentative and "should be thoroughly reviewed by experts based on scientific evidence" (section 5.1 of Method 2).

7 One-stage analysis for cybutryne

For cybutryne a one-stage analysis is described in both Method 1 and Method 2 of the brief sampling guidelines. The specimens are to be analysed in a GC-MS analysis. The procedure is the same for both methods.

8 One-stage analysis for cybutryne and organotin

For cybutryne and organotin a one-stage analysis is described in both Method 1 and Method 2 of the brief sampling guidelines. The specimens are to be analysed in a GC-MS analysis.

9 Conclusions on compliance

The Authority should only make conclusions on compliance based on the second-stage analysis of the sample (organotin). In case the results indicate non-compliance at that stage, there are clear grounds to take further steps.

For cybutryne the authority could make conclusions on compliance based on the one-stage analysis.

If considered necessary, more thorough sampling can be also carried out in addition or instead of brief sampling.

Sampling results should be communicated as soon as possible to the ship (as part of the inspection report) and in the case of non-compliance also to the flag State and recognized organization acting on behalf of the flag State if relevant.

Authorities should, in accordance with section 5.2 of the *Guidelines for brief sampling of anti-fouling systems on ships*, develop and adopt procedures to be followed for those cases where compliance with acceptable limits or lack thereof is unclear, considering additional sampling or other methodologies for sampling.

FORM S/1

REPORT OF INSPECTION OF A SHIP'S ANTI-FOULING SYSTEM (AFS)

SHIP PARTICULARS

1. Name of ship: **2. IMO number:**

3. Type of ship: **4. Call sign:**

5. Flag of ship: **6. Gross tonnage:**

7. Date keel laid / major conversion commenced:

INSPECTION PARTICULARS

8. Date & time:

9. Name of facility:
(dry dock, quay, location)

Place & country:

10. Areas inspected ☐Ship's logbook ☐Certificates ☐Ship's hull

11. Relevant certificate(s)

	(a) title	(b) issuing authority	(c) dates of issue
1.	*IAFS Certificate*		
2.	*Record of AFS*		
3.	*Declaration of AFS*		
4.			

12. Dry-dock period AFS applied:

13. Name of facility AFS applied:

14. Place & country AFS applied:

15. AFS samples taken ☐No ☐Yes Nature of sampling: ☐Brief ☐Extent

16. Reason for sampling of AFS:

17. Record sheet attached :
(country-code / IMO number / dd-mm-yy)

18. Copy to: ☐ PSCO ☐ Flag State ☐ Recognized organization
☐ Head office ☐ Master ☐ Other:

PORT STATE PARTICULARS

Reporting authority: _____ District office _____

Address: _____

_____

Telephone/Fax/Mobile: _____

E-mail: _____

Name:
(duly authorized inspector of reporting authority) _____

Date: _____ Signature: _____

FORM S/2

RECORD SHEET FOR THE SAMPLING PROCEDURE FOR COMPLIANCE WITH THE CONVENTION IN TERMS OF THE PRESENCE OF ORGANOTIN AND/OR CYBUTRYNE ACTING AS A BIOCIDE IN ANTI-FOULING SYSTEMS ON SHIP HULLS

RECORD NUMBER		(country-code / IMO number / dd-mm-yy)

Name of ship _____ IMO number: _____

SAMPLING PARTICULARS

1.	**Date & time initiated:**		**2.**	**Date & time completed**
3.	**Name of paint manufacturer:**			
4.	**AFS product name & colour:**			
5.	**Reason for sampling:**	☐ **Port State control**	☐ **Survey & certification**	☐ **Other flag State compliance inspection**
6.	**Sampling method**			
7.	**Hull areas sampled:**	☐ Port side	☐ Starboard side	☐ Bottom
	Number of sampling points:			
8.	**Back-up samples' storage location:** *(e.g. port State inspection office)*			
9.	☐ **Photos taken of the sample points**		Comments:	
10.	☐ **Paint samples (wet)**		Comments:	
11.	**Case A - Analysis of organotin only**			
	☐ First-stage analysis for organotin		Comments:	
	☐ Second-stage analysis for organotin		Comments:	
12.	**Case B - Analysis of cybutryne only**		Comments:	
	One-stage analysis for cybutryne			
13.	**Case C - Simplified approach to detect organotin and cybutryne**			
	One-stage analysis for organotin and cybutryne			
14.	**Comments concerning sampling procedure**			
15.	**Sampling company**		**Name**	
			Date	
			Signature	

PORT STATE PARTICULARS

Reporting authority: _____ **District office:** _____

Address: _____

_____

Telephone/Fax/ Mobile: _____

E-mail: _____

Name:
(duly authorized inspector of reporting authority) _____

Date: **Signature:**

FORM S/3

RECORD NUMBER	

Name of ship _____ IMO number: _____

METHOD 1 ANALYSIS

Case A - Analysis of organotin only

1.	**Instrument I.D.:**			**Calibration expire date:**		
2.	**Specimens 'A'** results			Total number of specimens 'A' analysed:		
3.	**No.**	**Sample location** *(frame & distance from boot topping)*	**mg Sn/kg**	**No.**	**Sample location** *(frame & distance from boot topping)*	**mg Sn/kg**
	1			**9**		
	2			**10**		
	3			**11**		
	4			**12**		
	5			**13**		
	6			**14**		
	7			**15**		
	8			**16**		
4.	**Results** Number of specimens exceeding 2,500 mg/kg: 1 or more specimens exceeding 3,000 mg/kg ☐ Yes ☐ No				☐Step 2 required ☐Compliance, no further analysis	
5.	**Additional comments concerning analysis of results from Specimens 'A'**					
6.	**Company**			**Name:** **Date:** **Signature:**		

7.	**Instrument I.D.:**				**Calibration expire date:**			
8.	**Specimens 'B'** results				Total number of specimens "B" analysed:			
9.	**No.**	**organotin** (mg Sn/kg) as Sn	**No.**	**organotin** (mg Sn/kg) as Sn	**No.**	**organotin** (mg Sn/kg) as Sn	**No.**	**organotin** (mg Sn/kg) as Sn
	1		**5**		**9**		**13**	
	2		**6**		**10**		**14**	
	3		**7**		**11**		**15**	
	4		**8**		**12**		**16**	

10.	**Results** Number of specimens exceeding 2,500 mg/kg: 1 or more specimens exceeding 3,000 mg/kg ☐ Yes ☐ No	☐Non-compliance assumed ☐Compliance assumed
11.	**Additional comments concerning analysis of results from Specimens 'B'**	
12.	**Company**	**Name:** **Date:** **Signature:**

Case B - Analysis of cybutryne only

Gas chromatography/mass spectrophotometry (GC/MS) analysis

1.	**Instrument I.D.:**		**Calibration expire date:**	
2.	**Specimens 'C'** results			
	Total number of specimens 'C' analysed by GC-MS:			
	Average concentration of cybutryne (mg of cybutryne per kg of dry paint):			
3.	**Conclusions** The average concentration of cybutryne exceeds the threshold of 1,250 mg of cybutryne per kg of dry paint			☐ Yes ☐ No. Compliance assumed.
4.	**Additional comments concerning analysis of results from Specimens 'C'**			
5.	**Company**		**Name:** **Date:** **Signature:**	

Case C - Simplified approach to detect organotin and cybutryne

Gas chromatography/mass spectrophotometry (GC/MS) analysis

1.	**Instrument I.D.:**		**Calibration expire date:**	
2.	**Specimens 'C'** results			
	Total number of specimens 'C' analysed by GC-MS:			
	Average concentration of organotin (mg Sn/kg of dry paint)			
	Average concentration of cybutryne (mg of cybutryne per kg of dry paint):			
3.	**Conclusions**			
	The average concentration of organotin exceeds the threshold of 3,000 mg Sn per kg of dry paint		☐ Yes ☐ No. Compliance assumed.	
	The average concentration of cybutryne exceeds the threshold of 1,250 mg of cybutryne per kg of dry paint		☐ Yes ☐ No. Compliance assumed.	
4.	**Additional comments concerning analysis of results from Specimens 'C'**			
5.	**Company**		**Name:** **Date:** **Signature:**	

FORM S/4

RECORD NUMBER	

Name of ship _____ IMO number: _____

METHOD 2 ANALYSIS

Case A - Analysis of organotin only

First stage

1.	**Instrument I.D.:**	**Calibration expire date:**

2.	**Sample location** (frame & distance from boot topping)	**Specimen I.D.**	**Sample disc**	**Content of tin (mg/ kg)**	**max**	**min**	**Average**
A		A1	☐ abrasive				
		A2	☐ metal				
		A3	☐ others				Average
		A4	☐ abrasive				
		A5	☐ metal				mg/kg
		A6	☐ others				☐>2,500 mg/kg
		A7	☐ abrasive				☐>3,000 mg/kg
		A8	☐ metal				
		A9	☐ others				
B		B1	☐ abrasive				
		B2	☐ metal				
		B3	☐ others				Average
		B4	☐ abrasive				
		B5	☐ metal				mg/kg
		B6	☐ others				☐>2,500 mg/kg
		B7	☐ abrasive				☐>3,000 mg/kg
		B8	☐ metal				
		B9	☐ others				
C		C1	☐ abrasive				
		C2	☐ metal				
		C3	☐ others				Average
		C4	☐ abrasive				
		C5	☐ metal				mg/kg
		C6	☐ others				☐>2,500 mg/kg
		C7	☐ abrasive				☐>3,000 mg/kg
		C8	☐ metal				
		C9	☐ others				
D		D1	☐ abrasive				
		D2	☐ metal				
		D3	☐ others				Average
		D4	☐ abrasive				
		D5	☐ metal				mg/kg

		D6	☐ others				☐>2,500 mg/kg
		D7	☐ abrasive				☐>3,000 mg/kg
		D8	☐ metal				
		D9	☐ others				
3.	**Results first-stage analysis** ☐ ____ samples out of ____ are above 2,500 mg/kg ☐ sample(s) ____ is (are) above 3,000 mg/kg					☐Compliant ☐Second stage required	
4.	**Comments**						
5.	**Company**		Name Date Signature				

Second stage

1.	**Instrument I.D.:**	**Calibration expire date:**

2.	**Specimen used** *(Specimen I.D.)*	**Content of tin first stage** *(XRF analysis) (mg Sn/kg)*	**Content of tin second stage** *(as organotin) (mg Sn/kg)*	**Compliance**
A				
				☐>2,500 mg/kg
				☐>3,000 mg/kg
B				
				☐>2,500 mg/kg
				☐>3,000 mg/kg
C				
				☐>2,500 mg/kg
				☐>3,000 mg/kg
D				
				☐>2,500 mg/kg
				☐>3,000 mg/kg

3.	**Results second stage analysis** ☐ ____ samples out of ____ are above 2,500 mg/kg (dry paint) ☐sample(s) ____ is (are) above 3,000 mg/kg (dry paint)	☐ Compliant ☐ Not compliant	
4.	**Comments**		
5.	**Company**	Name Date Signature	

Case B – Analysis of cybutryne only

Gas chromatography/mass spectrophotometry (GC/MS) analysis for cybutryne determination

1.	**Instrument I.D.:**	**Calibration expire date:**

2.	**Results of GC-MS analysis**		
	Average concentration (mg of cybutryne per kg of dry paint)		☐ Compliant ☐ Not compliant
3.	**Comments**		
4.	**Company**	Name Date	

Case C – Simplified approach to detect organotin and cybutryne

Gas chromatography/mass spectrophotometry (GC/MS) analysis for cybutryne and organotin determination

1.	**Instrument I.D.:**	**Calibration expire date:**

2.	**Results of GC-MS analysis**		
	Average concentration of organotin (mg Sn/kg)		☐ Compliant ☐ Not compliant
	Average concentration of cybutryne (mg of cybutryne per kg of dry paint)		☐ Compliant ☐ Not compliant
3.	**Comments**		
4.	**Company**	Name Date	

PORT STATE PARTICULARS

Reporting authority: District office:

Address: _____

_____

Telephone/Fax/Mobile: _____

E-mail: _____

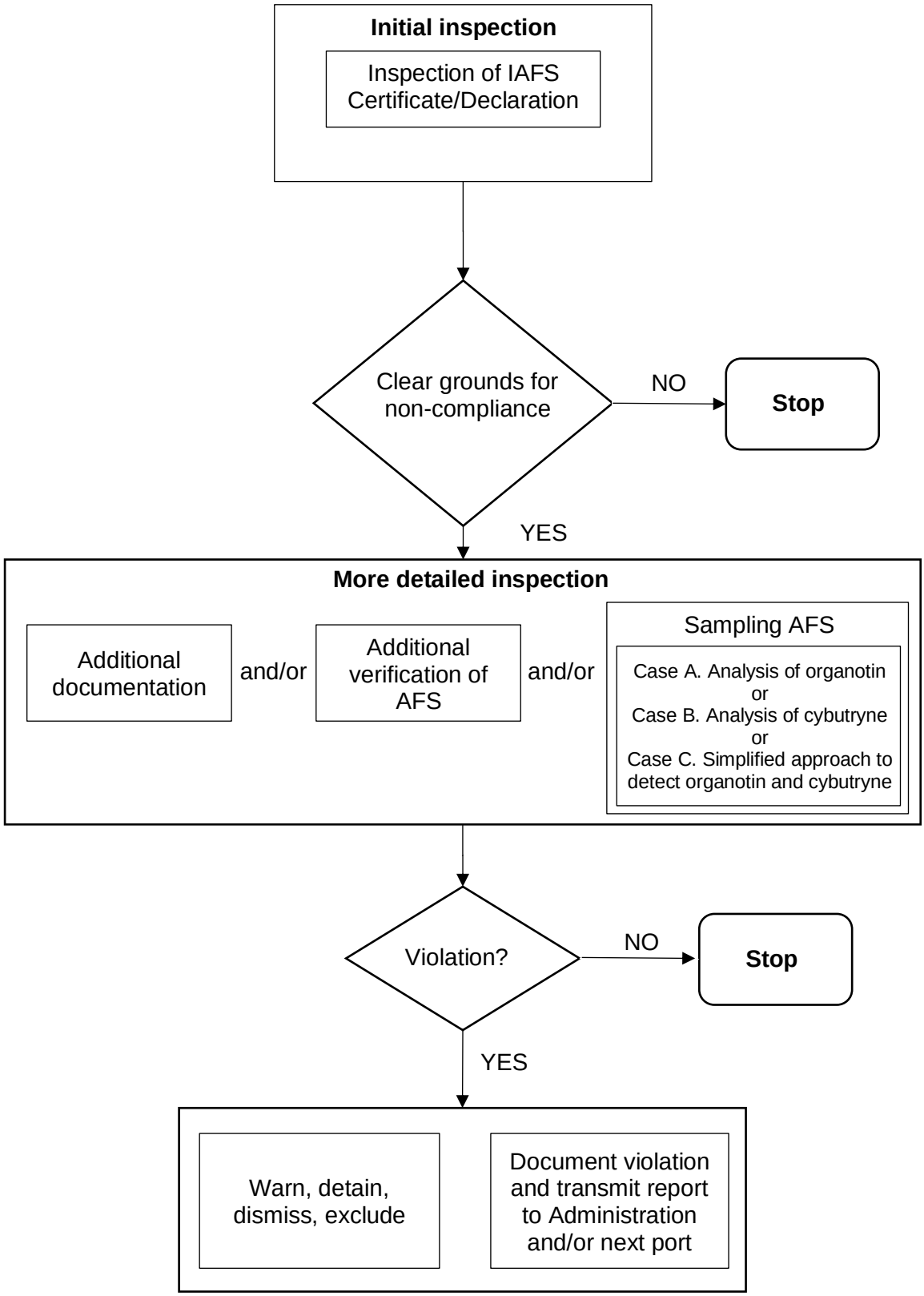
Name: _____

(duly authorized inspector of reporting authority) _____

Date: _____ Signature: _____

APPENDIX 2

AFS INSPECTION PROCESS



***

Annex 21

Resolution MEPC.358(78)

(adopted on 10 June 2022)

2022 Guidelines for Survey and Certification of Anti-fouling Systems on Ships

ANNEX 21

RESOLUTION MEPC.358(78)
(adopted on 10 June 2022)

2022 GUIDELINES FOR SURVEY AND CERTIFICATION OF ANTI-FOULING SYSTEMS ON SHIPS

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee conferred upon it by the international conventions for the prevention and control of marine pollution,

RECALLING ALSO that the International Conference on the Control of Harmful Anti-fouling Systems for Ships, 2001, held in October 2001, adopted the International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001 (the AFS Convention) together with four Conference resolutions,

NOTING that article 10 of the AFS Convention prescribes that ships shall be surveyed and certified in accordance with the regulations of annex 4 of the Convention,

NOTING ALSO that regulation 1(4)(a) of annex 4 of the AFS Convention refers to the guidelines to be developed by the Organization,

NOTING FURTHER resolution MEPC.195(61) by which the Committee adopted the *2010 Guidelines for survey and certification of anti-fouling systems on ships*,

RECALLING FURTHER that at its seventy-sixth session it adopted amendments to the AFS Convention to introduce controls on cybutryne through resolution MEPC.331(76),

RECOGNIZING the need for a consequential revision of the guidelines associated with the AFS Convention due to the aforementioned amendments,

NOTING FURTHER that through resolutions MEPC.356(78) and MEPC.357(78) the Organization adopted *2022 Guidelines for brief sampling of anti-fouling systems on ships* and *2022 Guidelines for inspection of anti-fouling systems on ships*, respectively, and

HAVING CONSIDERED a revised text of the *Guidelines for survey and certification of anti-fouling systems on ships* prepared by the Sub-Committee on Pollution Prevention and Response at its ninth session,

1 ADOPTS the *2022 Guidelines for survey and certification of anti-fouling systems on ships* (2022 Guidelines), the text of which is set out in the annex to this resolution;

2 INVITES Governments to apply the 2022 Guidelines as soon as possible, or when the Convention becomes applicable to them;

3 RECOMMENDS that the Guidelines be reviewed on a regular basis;

4 REVOKES resolution MEPC.195(61).

ANNEX

2022 GUIDELINES FOR SURVEY AND CERTIFICATION OF ANTI-FOULING SYSTEMS ON SHIPS

1 General

1.1 Article 10 of the International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001, hereinafter referred to as "the Convention", prescribes that ships shall be surveyed and certified in accordance with the regulations of annex 4 to the Convention. The purpose of this document is to provide the *Guidelines for surveys and certification of anti-fouling systems on ships* referred to in regulation 1(4)(a) of annex 4, hereinafter referred to as the "Guidelines", that will assist the Administrations and recognized organizations in the uniform application of the provisions of the Convention and assist companies, shipbuilders, manufacturers of anti-fouling systems, as well as other interested parties to understand the process of the surveys and issuance and endorsement of the certificates.

1.2 These Guidelines provide the procedures for survey to ensure that a ship's anti-fouling system complies with the Convention, and those necessary for issuance and endorsement of an International Anti-fouling System Certificate. A guidance for compliant anti-fouling systems is given in appendix I to this annex.

1.3 These Guidelines apply to surveys of ships of 400 gross tonnage and above engaged in international voyages, excluding fixed or floating platforms, floating storage units (FSUs), and floating production storage and off-loading units (FPSOs), as specified in regulation 1(1) of annex 4 to the Convention.

1.4 The sole purpose of the survey activities described in these Guidelines is to verify compliance with the provisions of the Convention. Consequently, such surveys do not relate to any aspect not regulated by the Convention even if such aspects relate to the performance of an anti-fouling system on the hull of a ship, including the quality of workmanship during the application process.

1.5 In the event that a new survey method is developed, or in the event that the use of a certain anti-fouling system is prohibited and/or restricted, or in the light of experience gained, these Guidelines may need to be revised in the future.

2 Definitions

For the purposes of these guidelines:

2.1 "Administration" means the Government of the State under whose authority the ship is operating. With respect to a ship entitled to fly a flag of a State, the Administration is the Government of that State. With respect to fixed or floating platforms engaged in exploration and exploitation of the seabed and subsoil thereof adjacent to the coast over which the coastal State exercises sovereign rights for the purposes of exploration and exploitation of their natural resources, the Administration is the Government of the coastal State concerned.

2.2 "Anti-fouling system" means a coating, paint, surface treatment, surface, or device that is used on a ship to control or prevent attachment of unwanted organisms.

2.3 "Company" means the owner of the ship or any other organization or person such as the manager or the bareboat charterer, who has assumed the responsibility for the operation of the ship from the owner of the ship and who, on assuming such responsibility, has agreed to take over all duties and responsibilities imposed by the International Safety Management (ISM) Code.

2.4 "Gross tonnage" means the gross tonnage calculated in accordance with the tonnage measurement regulations contained in annex 1 to the International Convention on Tonnage Measurement of Ships, 1969, or any successor Convention.

2.5 "International voyage" means a voyage by a ship entitled to fly the flag of one State to or from a port, shipyard, or offshore terminal under the jurisdiction of another State.

2.6 "Length" means the length as defined in the International Convention on Load Lines, 1966, as modified by the Protocol of 1988 relating thereto, or any successor Convention.

2.7 "Ship" means a vessel of any type whatsoever operating in the marine environment and includes hydrofoil boats, air-cushion vehicles, submersibles, floating craft, fixed or floating platforms, floating storage units (FSUs) and floating production storage and off-loading units (FPSOs).

3 General requirements for surveys

3.1 An initial survey covering at least the scope as in paragraph 1 of appendix II to these Guidelines should be held before the ship is put into service and the International Anti-fouling System Certificate required under regulation 2 or 3 of annex 4 to the Convention is issued for the first time.

3.2 A survey should be carried out whenever an anti-fouling system is changed or replaced. Such surveys should cover the scope as in paragraph 2 of appendix II to these Guidelines.

3.3 A major conversion affecting the anti-fouling system of a ship may be considered as a newbuilding as determined by the Administration.

3.4 Repairs generally do not require a survey. However, repairs affecting approximately twenty-five (25) per cent or more of the anti-fouling system should be considered as a change or replacement of the anti-fouling system.

3.5 A non-compliant anti-fouling system controlled under annex 1 to the Convention that undergoes repair must be repaired or replaced with a compliant anti-fouling system.

4 Request for survey

4.1 Prior to any survey, a request for survey should be submitted by the Company to the Administration, or to a recognized organization, along with the ship's data required in the International Anti-fouling System Certificate as listed:

.1 Name of ship

.2 Distinctive number or letters

.3 Port of registry

.4 Gross tonnage

.5 IMO number.

4.2 A request for survey should be supplemented by a declaration and supporting information from the anti-fouling system manufacturer, confirming that the anti-fouling system

applied, or intended to be applied to the ship is in compliance with the requirements of the Convention (with an identification of the version of the Convention referred to). Such declaration should provide the following information contained in the Record of Anti-fouling System, as can be found in appendix I to annex 4 to the Convention:

.1 Type of anti-fouling system*.

.2 Name of anti-fouling system manufacturer.

.3 Name and colour of anti-fouling system.

.4 Active ingredient(s) and their Chemical Abstract Service Registry Number(s) (CAS number(s)).

4.3 Information required by the surveyor regarding compliance of the product with the Convention should be found in a declaration from the anti-fouling system manufacturer which may be provided on the anti-fouling system container and/or on supportive documentation (such as Material Safety Data Sheets (MSDS), or similar). A link between the supportive documentation and the relevant container should exist.

5 Conduct of surveys

5.1 **Initial surveys** (Surveys in accordance with regulation 1(1)(a) of annex 4 to the Convention)

.1 The initial survey should verify that all applicable requirements of the Convention are complied with.

.2 As part of the survey, it should be verified that the anti-fouling system specified by the documentation submitted with the request for survey complies with the Convention. The survey should include verification that the anti-fouling system applied is identical to the system specified in the request for survey.

.3 Taking into account experience gained and the prevailing circumstances, the initial survey should include the tasks as listed in paragraph 1 of appendix II to these Guidelines.

.4 The verification tasks set out in paragraph 5.1.2 should be conducted at any time, either before, during, or after the anti-fouling system has been applied to the ship, as deemed necessary to verify compliance. No checks or tests must affect the integrity, structure or operation of the anti-fouling system.

5.2 **Surveys when the anti-fouling systems are changed or replaced** (Surveys in accordance with regulation 1(1)(b) of Annex 4 to the Convention)

.1 If the existing anti-fouling system is confirmed by an International Anti-fouling System Certificate not to be controlled under annex 1 to the Convention, the provisions described in paragraphs 5.1 and 5.2 apply.

* Examples of suitable wording could be: Organotin-free self- polishing type, Organotin-free ablative type, Organotin-free conventional, Biocide-free silicon type paint, others. In the case of an anti-fouling system containing no active ingredients, the words "biocide-free" should be used.

.2 If the existing anti-fouling system is declared not to be controlled under annex 1 of the Convention, without being documented by an International Anti-fouling System Certificate, a verification should be carried out to confirm that the anti-fouling system complies with the requirements of the Convention. This verification may be based on sampling and/or testing and/or reliable documentation, as deemed necessary based on experience gained and the existing circumstances. Documentation for verification could, for example, be MSDS, or similar, a declaration of compliance from the anti-fouling system manufacturer, invoices from the shipyard and/or the anti-fouling system manufacturer. To verify the new anti-fouling system, the provisions described in paragraph 5.1 apply.

.3 If the existing anti-fouling system has been removed, the removal should be verified in addition to the provisions described in paragraph 5.1.

.4 If a sealer coat has been applied, a verification should be carried out to confirm that the name, type and colour of the sealer coat applied to the ship match those specified in the request for survey, and that the existing anti-fouling system has been covered with that sealer coat. Additionally the provisions described in paragraph 5.1 apply.

.5 An existing anti-fouling system controlled under annex 1 of the Convention, containing organotin:

.1 applied on/after 1 January 2003 or a later date if specified by the Administration, should be removed in accordance with paragraph 5.2.3;

.2 applied before 1 January 2003 or a later date if specified by the Administration, must have been removed or covered by a sealer coat in accordance with paragraph 5.2.4, not later than 60 months after its application and latest on 1 January 2008.

.6 An existing anti-fouling system controlled under annex 1 of the Convention, containing cybutryne in the external coating layer:

.1 applied before 1 January 2023, should be removed or covered by a sealer coat in accordance with paragraph 5.2.4.

.7 The survey should include the tasks as listed in paragraph 2 of appendix II to these Guidelines.

5.3 **Surveys of existing ships requesting only an International Anti-fouling System Certificate**

.1 If the existing anti-fouling system is declared not to be controlled under Annex 1 to the Convention, a verification should be carried out to confirm that the anti-fouling system complies with the requirements of the Convention. This verification may be based on sampling and/or testing and/or reliable documentation, as deemed necessary based on experience gained and the existing circumstances. Such documentation could be MSDS or similar, a declaration of compliance from the anti-fouling system manufacturer, invoices from the shipyard and/or the anti-fouling system manufacturer. If this information raises no reasonable doubt that the system applied is compliant with annex 1 of the Convention, the International Anti-fouling System Certificate may be issued on this basis.

6 Issuing or endorsing the International Anti-fouling System Certificate

6.1 The International Anti-fouling System Certificate along with the Record of Anti-fouling Systems should be:

.1 issued upon satisfactory completion of the initial survey;

.2 issued upon acceptance of another Party's International Anti-fouling System Certificate; or

.3 endorsed upon satisfactory completion of a survey for change or replacement of an anti-fouling system.

APPENDIX I

Guidance for compliant anti-fouling systems

1 For the purpose of compliance with annex 1 to the Convention in respect to organotin compounds

Small quantities of organotin compounds acting as a chemical catalyst (such as mono- and di-substituted organotin compounds) are allowed, provided that they are present at a level which does not provide a biocidal effect to the coating. On a practical level, when used as a catalyst, an organotin compound should not be present above 2,500 mg total tin per kilogram of dry paint.

2 For the purpose of compliance with annex 1 to the Convention in respect to cybutryne

2.1 When samples are directly taken from the hull

It could be expected that the distribution of the remaining anti-fouling paint on the hull surface is not uniform. Due to hull design and consequent action of the sea water during the service life of the paint, the paint may not have uniformly eroded, some parts in the hull may still have some paint, other parts may not have any paint left. Therefore, the brief samples taken from the hull surface should be representative of the anti-fouling system applied. Average values of cybutryne should not be present above 1,000 mg of cybutryne per kilogram of dry paint. Below this level any remaining cybutryne is expected not to create a negative impact to the marine environment.

2.2 When samples are taken from wet paint containers

Cybutryne should not be present at a level which does provide a biocidal effect (i.e. average values of cybutryne should not be present above 200 mg of cybutryne per kilogram of dry paint).

APPENDIX II

Guidance for surveys under the International Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS 2001)

(FI) 1 Initial survey (AFS 2001, annex 4, regulation 1(1)(a))

(FI) 1.1 confirming that a Declaration and supporting information from the anti-fouling system manufacturer, specifying that the anti-fouling system and, where applicable, the sealer coat intended to be applied to the ship are in compliance with the requirements of the Convention, is provided (AFS 2001);

(FI) 1.2 verifying that the relevant containers of the anti-fouling system show same data as the supporting information (AFS 2001);

(FI) 1.3 confirming that the existing anti-fouling system, if controlled under annex 1 of the Convention, has been removed or that a sealer coat has been applied (AFS 2001);

(FI) 1.4 verifying, where applicable, that the relevant containers of the sealer coat applied show same data as the supporting information (AFS 2001);

(FI) 1.5 where supporting information from the anti-fouling system manufacturer is not available or does not provide sufficient information, sampling or testing or other checks conducted on site, of the anti-fouling system;

(FI) 1.6 for ships of 24 m or more in length but less than 400 GT and engaged in international voyages, confirming that the owner or owner's authorized agent has completed a Declaration on Anti-fouling System (AFS 2001);

(FR) 2 Surveys when anti-fouling systems are changed or replaced (AFS 2001, annex 4, regulation 1(1)(b));

(FR) 2.1 confirming that a Declaration and supporting information from the anti-fouling system manufacturer, specifying that the anti-fouling system and, where applicable, the sealer coat intended to be applied to the ship are in compliance with the requirements of the Convention, is provided (AFS 2001);

(FR) 2.2 verifying that the relevant containers of the anti-fouling system show same data as the supporting information (AFS 2001);

(FR) 2.3 confirming that the existing anti-fouling system, if controlled under annex 1 of the Convention, has been removed or that a sealer coat has been applied (AFS 2001);

(FR) 2.4 verifying, where applicable, that the relevant containers of the sealer coat applied show same data as the supporting information (AFS 2001);

(FR) 2.5 for ships of 24 m or more in length but less than 400 GT, confirming that the owner or owner's authorized agent has completed a Declaration on Anti-fouling System (AFS 2001);

(FR) 2.6 endorsement of the Record of Anti-fouling Systems.

***