

Global and Country Antifouling, Biofouling and Energy Efficiency Regulations and Initiatives

**Neal Blossom
American Chemet Corporation
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Where have we been?

Where are we going?

Antifouling Regulation

Reducing Risks and Maximizing Benefits

- ▶ **Risks**

- ▶ Human Exposure
- ▶ Environmental Exposure

- ▶ **Benefits**

- ▶ Fuel Savings
- ▶ Reduced Non-Indigenous Species Transport
- ▶ Faster Transport
- ▶ Easier Maneuvering for Safety

Global Regulations and Initiatives

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Proposed Irgarol (Cubutyrne) Ban

- ▶ Proposal to IMO for consideration using the International Convention on the Control of Harmful Anti-Fouling Systems on Ships.
- ▶ EU, Australia and New Zealand have bans in place already.
- ▶ Risk Reduction Regulation

Risk Analysis Methods Used

- ▶ **MAMPEC** - a model to predict environmental concentrations of antifoulants in harbours and estuaries. A global standard.
- ▶ **ISO 10890:2010 (Mass Balance Leach Rate Method)** w/a 2.9 correction factor. Becoming the most globally accepted method.
- ▶ Some global consistency in evaluating risk.

International Maritime Organization (IMO) Energy Usage

- ▶ **Mandatory Shipping Energy Efficiency Standard - January 2013**
 - ▶ **2016 Guidelines for a required Ship Energy Efficiency Management Plan (SEEMP) includes Hull Maintenance**
- ▶ **April 2018, IMO adopted a strategy to reduce greenhouse gas emissions by 50% by 2050.**
- ▶ **Maximizing Benefits of Antifouling**

IMO's Guidelines for Biofouling Management

- ▶ **Guidelines for Managing Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species - Adopted 2011**
- ▶ **Guidance for Managing Recreational Craft Biofouling to Minimizing the Transfer of Invasive Aquatic Species - Adopted 2012**
- ▶ **Maximize Benefits of Antifouling**

GloFouling Project

- ▶ **Global project to help protect marine ecosystems from invasive aquatic species.**
 - ▶ **Primary Focus is developing nations**
 - ▶ **Over \$6.9 million in funding. In preparation phase.**
- ▶ **Founding Organizations - Global Environment Facility, the United Nations Development Programme and IMO**
- ▶ **Initiative to maximize benefits of antifouling.**

Country and Region Specific Regulations and Initiatives

The background features abstract, overlapping geometric shapes in various shades of blue, ranging from light sky blue to deep navy blue. These shapes are primarily located on the right side of the slide, creating a modern, dynamic feel. The text is positioned on the left side of the slide, set against a plain white background.

EU - Biocide Product Regulation



- ▶ Active ingredient review nearly complete
- ▶ Coatings dossiers submitted by 1/1/2018. Review has begun.
- ▶ Risk management regulation.

Status of Antifouling Actives in the EU



Name	Approvals			
	Professional	Amateur	Commercial + Super Yacht	Yacht
Copper	X	X	X	X
Cuprous Oxide				
Copper Thiocyanate				
Copper Flake				
Tralopyril (ECONEA)	X		X	
Metetomidine (Selektope)	X	X	X	X
DCOIT (Sea-Nine)	X		X	
Zineb	X	X	X	X
Cu Pyrithione	X		X	X
Zn Pyrithione	Under review			

Canada



- ▶ Reevaluated and approved copper actives 2016.
- ▶ Copper containing actives only antifouling actives registered
 - ▶ Cuprous Oxide - in all 54 registered coatings.
 - ▶ ASTM leach rate limit 40 $\mu\text{g Cu/cm}^2/\text{day}$. In place since 1997?
- ▶ Aquatic Invasive Species Action Plan - few specifics

Japan

- ▶ Chemical Substance Control Law - Evaluation and Regulation of Chemicals
- ▶ Substances prioritized for assessment based on risks
- ▶ Several actives for aquaculture are scheduled for evaluation in 2018 and 2019
- ▶ Cuprous oxide is not on the priority list.



India



- ▶ Proposed Guidelines for the Registration of Biocides and Biocidal Products - May 12, 2018
- ▶ Unclear if there are requirements for antifouling actives and coatings
- ▶ Includes registration of biocides described as In-can preservatives and paint additives “*for killing or repelling insects*”
- ▶ List of Insecticides
 - ▶ <http://www.cibrc.nic.in/schedulelist.pdf>
 - ▶ Cuprous Oxide, Zineb, Zinc Pyrithione, Diuron

Malaysia



- ▶ **Registering Antifouling Active Ingredients**
 - ▶ Cuprous oxide has been approved and registered.
- ▶ Unknown if the antifouling coatings must be registered.

USA



- ▶ Current registered active ingredients
 - ▶ Cuprous oxide, copper thiocyanate, metallic copper, copper pyrithione, zinc pyrithione, Zineb, DCOIT (Sea-Nine), Tralopyril (ECONEA), Irgarol, silver, zinc
- ▶ EPA 15 Year Registration Review Cycle for Biocides.
 - ▶ Copper going through review. Appears headed for approval (2018?). Potentially recreational coating leach rate limits. Using MAMPEC model. Leach rate method in discussion.

Washington state - Recreational Vessel Coating Legislation



- ▶ In 2011 Legislation ban on copper in recreational vessel coatings starting in 2018.
- ▶ 2017 Review of alternatives led to a concern that “..we are pushing the boating industry toward regrettable substitutes..”
- ▶ 2018 Rescinded the ban. New legislation delays decision to 2021. Considering alternatives such as leach rate limit for recreational coatings.

California

- ▶ July 1, 2018 Leach rate limit of $9.5 \mu\text{g}/\text{cm}^2/\text{day}$ for copper for recreational vessel coatings only.
 - ▶ Using ISO Method 10890:2010 w/ 2.9 correction factor.
 - ▶ Used MAMPEC model.
- ▶ Biofouling Management Regulations to Minimize the Transfer of Nonindigenous Species from Vessels Arriving at California Ports (Oct. 1, 2017)



New Zealand



- ▶ **Evaluation and Review of Antifouling Paints - 2013**
 - ▶ **Actives Approved - Copper (cuprous oxide), Copper Thiocyanate, Copper Pyrithione, DCOIT, Dichlofluinid, Mancozeb, Tolyfluanid, Zineb, Zinc pyrithione**
 - ▶ **Time limited approvals - Diuron (4 yrs), Octhilinone (4 yrs), Thiram (1 July 2013), Ziram (now banned)**
 - ▶ **Revoked Approvals - Chlorothalonil, Irgarol 1051**
 - ▶ **Much of the data from EU and USA dossiers.**
- ▶ **Extensive Biofouling Management Guidelines and Regulations. Including 2018 Craft Risk Management Standard for Biofouling.**

Australia



- ▶ **Biocidal antifouling coatings must be registered but not active ingredients.**
- ▶ **Extensive Biofouling Management Regulations**
- ▶ **Northwest Territories and Western Australia have specific biofouling management regulations**

Korea



- ▶ K-REACH came into force Jan. 1, 2015.
 - ▶ Cuprous oxide is being supported. Data is mostly from EU data base.
- ▶ K-BPR comes into force Jan. 1, 2019
 - ▶ Antifouling Agents have a grace period of 10 years while other biocides are reviewed

Regulation and Initiative Summary

- Where we were, Where we are going, Risks and Benefits



- ▶ Previous major focus - Minimize RISK - weeding out of antifouling actives.
- ▶ Country by country risk evaluation is becoming a review of data from previous risk assessments using similar methodology.
- ▶ Current and future focus - Maximize BENEFITS - optimize vessel performance and minimize non-indigenous species introduction.