

# A 12-Month Comparison of Copper-Free and Copper-Based Antifouling Coating Systems

David Helmer  
Janssen PMP

Who We Are

JANSSEN PMP - Preservation & Material Protection  
Division of Janssen Pharmaceutica N.V.  
Member of Johnson & Johnson Family of Co.'s

## Janssen PMP Product Portfolio

- **Marine antifouling (AF) agents**
- Wood preservatives
- Products for food chain management
- Preservatives for other industrial applications (e.g. MWF, textiles, polymers, paints, adhesives, sealants, ...)

## What is ECONEA™?

Common name (ISO):

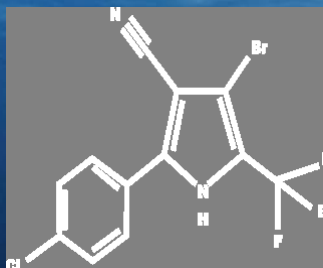
- Tralopyril

Chemical name:

- 2-(p-chlorophenyl)-3-cyano-4-bromo-5-trifluoromethyl pyrrole

CAS number:

- 122454-29-9



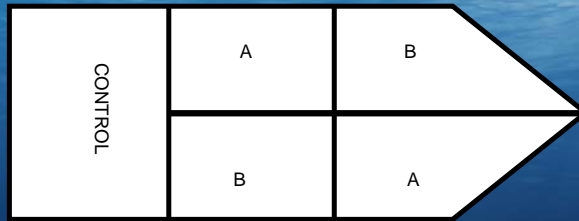
## Key Features

- Highly effective against hard fouling at 3 to 6%
- Short half life in salt and fresh water
- Low risk for galvanic corrosion
- Light weight
- Thermal and UV stable
- Low water solubility

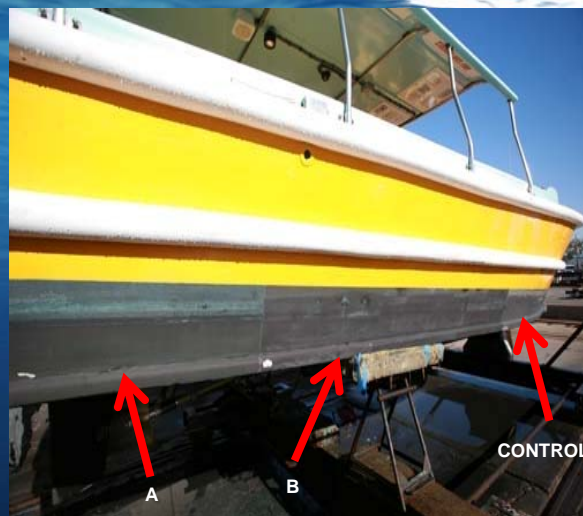
## California Research Authorization Trial

- 23 vessels in the trial
  - 7 sailboats
  - 9 pleasure craft power
  - 7 commercial “workboats”
- 5 locations from San Francisco to San Diego
- 20 fiberglass hulls, 2 wood hulls, one steel hull
- 8 different test paints
- 2 copper based standard paints  
(67% + booster and 45%)

## Hull Paint Configuration



## Hull Paint Configuration



## Ratings

### What Was Rated

- Waterline
- Underwater
- Hard Fouling
  - Barnacles
  - Coral
  - Tube worms
  - Mussels
- Weeds
- Slime

### Rating Scale

- 0 None
- 1 Mild
- 2 Moderate
- 3 Significant
- 4 Heavy
- 5 Very Heavy

## California Research Authorization Trial

- No hull scrubbing permitted
- Vessels hauled out and inspected after 6 and 12 months
- Rated before power washing
- Four boats were sold and did not complete the trial

## Animal Fouling



## Animal Fouling



## Algae



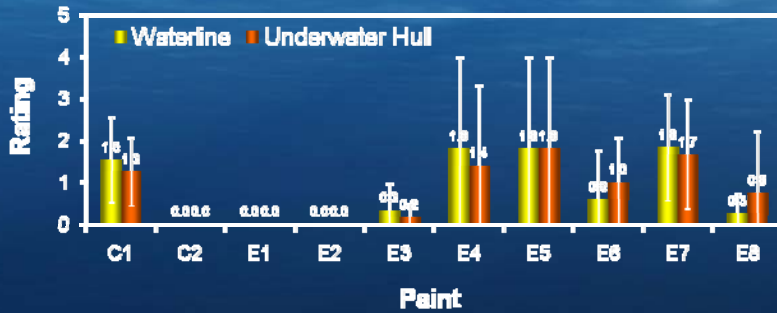
## Slime





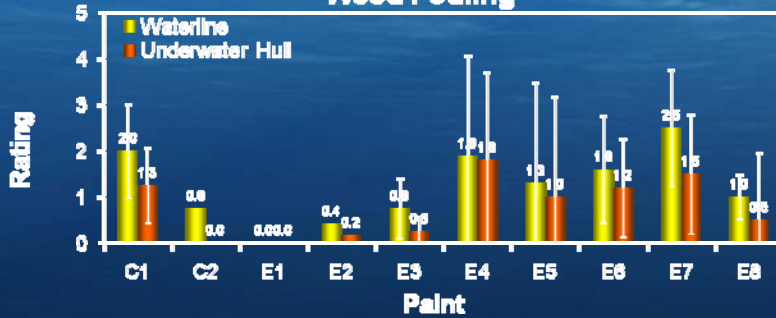
## Mean AF Performance Ratings per Paint 12 Months

### Animal Fouling



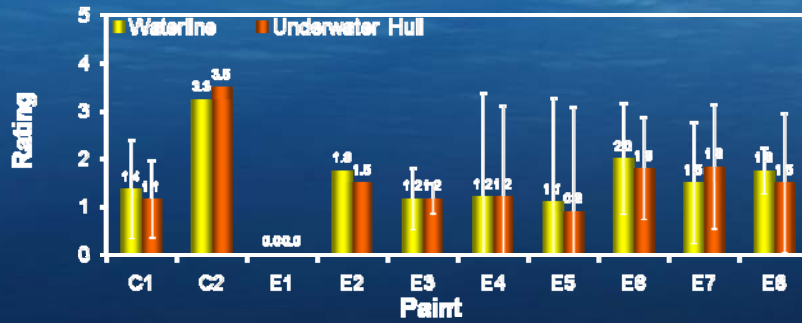
## Mean AF Performance Ratings per Paint 12 Months

### Weed Fouling



## Mean AF Performance Ratings per Paint 12 Months

### Slime Fouling



## Channel Keeper



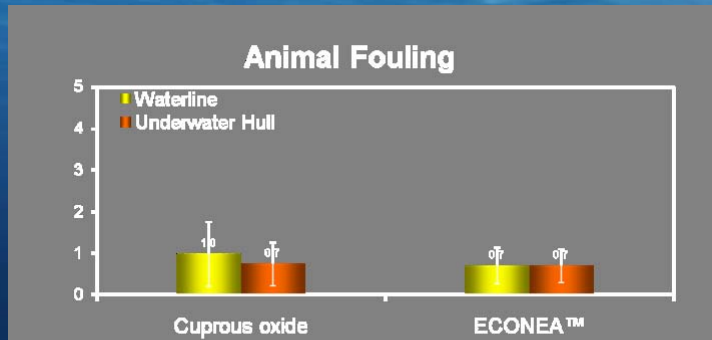
## Channel Keeper



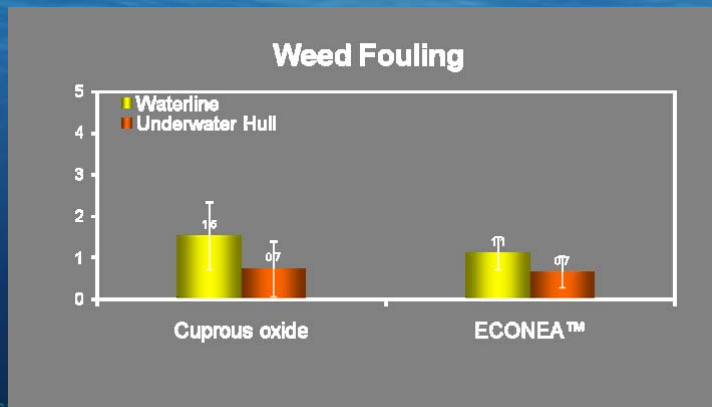
## Key Largo



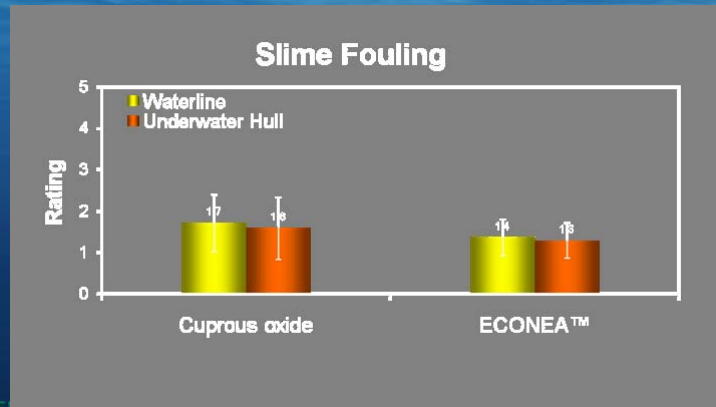
## Mean AF Ratings ECONEA™ vs. Copper 12 Months



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## Mean AF Ratings ECONEA™ vs. Copper 12 Months



## Conclusions

- ECONEA containing coatings provided hard fouling protection equivalent to copper-based paints
- Co-biocides provided slime and algae protection equivalent to copper based systems
- The use pattern of the boat impacts the performance of the antifouling coatings