



Advanced Antifouling Paint System of TAKATA QUANTUM *X-mile*

X-mile Premium



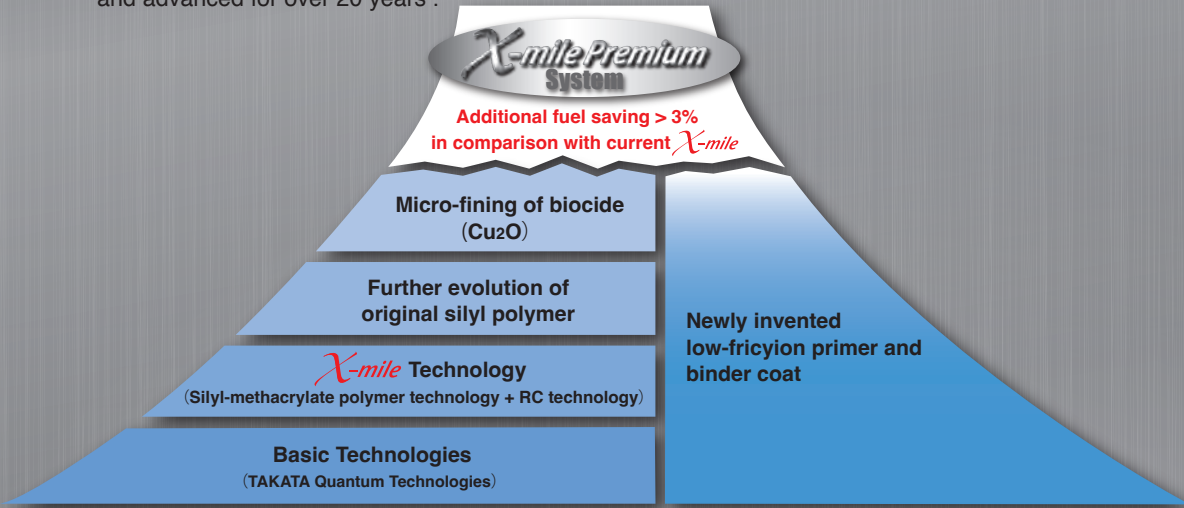
Save the earth by reliable technologies
“Made in Japan” !

KANSAI PAINT MARINE CO.,LTD.

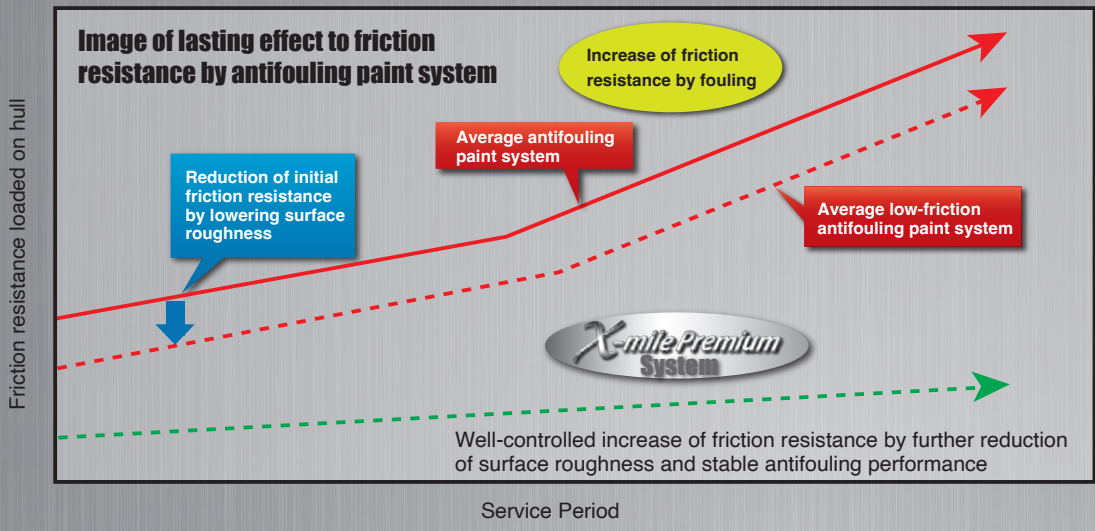
Key Technologies of *X-mile Premium* System

The advent of the most advanced antifouling paint system which transcends TAKATA QUANTUM *X-mile* and provides further fuel saving for your fleet !

X-mile Premium system is a reliable and epoch-making antifouling paint system supported by several key technologies invented for further improving antifouling performance and reducing friction resistance on top of well-proven technologies of TAKATA QUANTUM series cultivated and advanced for over 20 years .



The key to maximize fuel saving by antifouling paint system is to maintain **low surface roughness**, **excellent antifouling performance** and **stable physical property of paint film** for a long term.



Hull condition of chemical tanker coated with an "advanced antifouling paint " after 30months



Hull condition of LNG carrier coated with an "advanced antifouling paint" after 36 months

How can you expect true fuel saving by these kinds of so-called "advanced antifouling paint"?

Succession of Technologies

TAKATA
QUANTUM *X-mile*

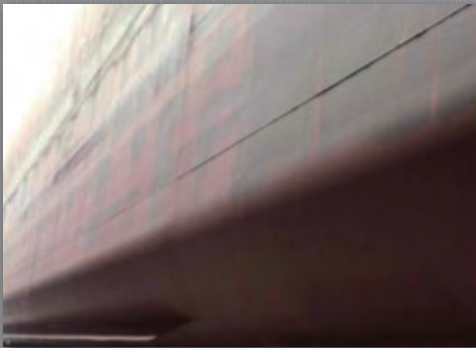
Since its launching in 1995, more than 7,000 vessels have been coated with TAKATA QUANTUM series world-wide. TAKATA QUANTUM *X-mile* launched in April, 2011, has been repeatedly applied to over 700 vessels and used by most quality-conscious customers who have priority over fuel saving and environmental issue with its effectiveness and excellent performance.



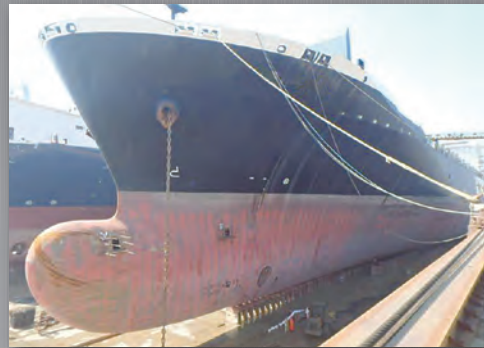
LNG Carrier (after 35 months)



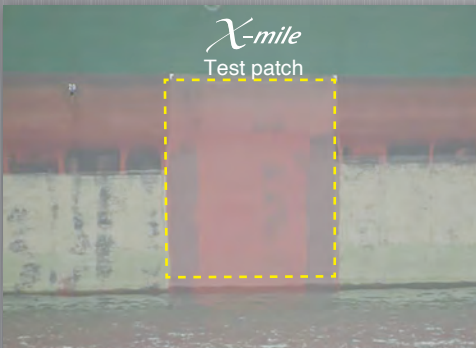
Car Carrier (after 25 months)



Bulk Carrier (after 30 months)



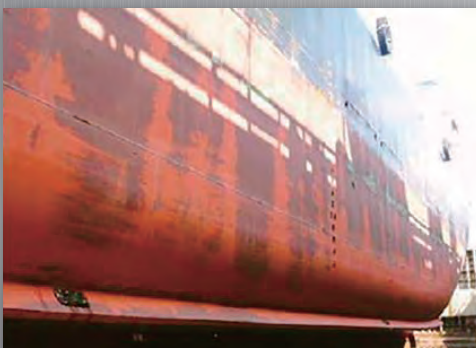
Container Carrier (after 32 months)



LNG Carrier (after 17 months)



Bulk Carrier (after 31 months)



Coastal Freighter (after 31 months)



Coastal Ferry (after 12 months)

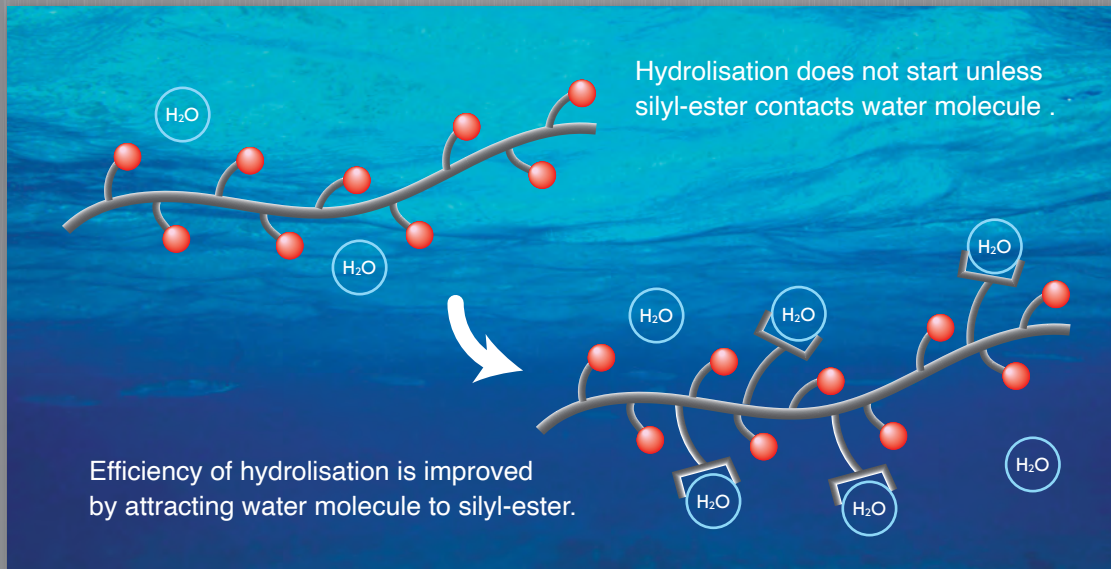
Further Evolution of Original Silyl Polymer

Nano-technology has enabled silyl-methacrylate polymer incorporated in TAKATA QUANTUM *X-mile* to hydrolyze from initial stage of water immersion at more stable and efficient pace than ever by adding the function of optimizing water contact to its properties.

Stable antifouling performance from initial stage of water immersion and smooth release of slime layer grown in static condition

Reduction of friction resistance at start of voyage

Image of polymer evolution



Hull condition of coastal vessel applied with *X-mile Premium* System after 10 months

*** No visible slime attachment even under low operation ratio!**

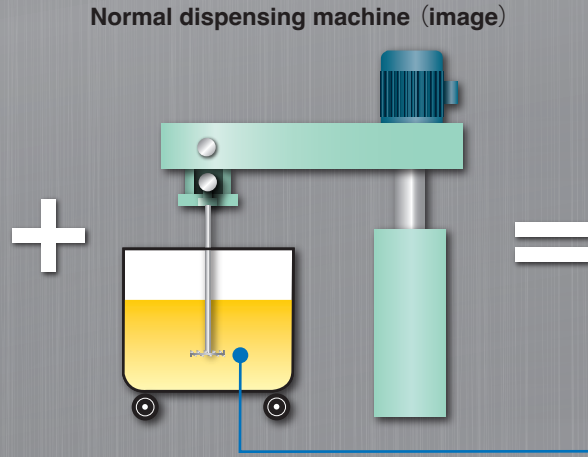
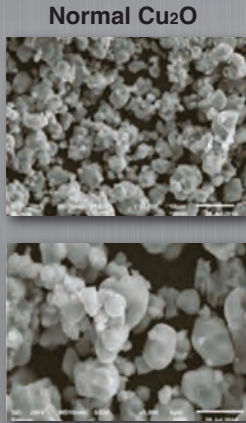


Shipowner comment : Fuel saving was improved at approx. 6%, which saved fuel cost by approx. US\$52,000 per year. (Vessel speed : 12 - 13 knot, Operation ratio : 55%, Service period : 10 months)

Micro-finishing of Biocide (Cu₂O)

Carefully selected small particle cuprous oxide and centralised production by latest highly efficient dispensing equipment are the keys to maximize the antifouling performance of biocide (Cu₂O).

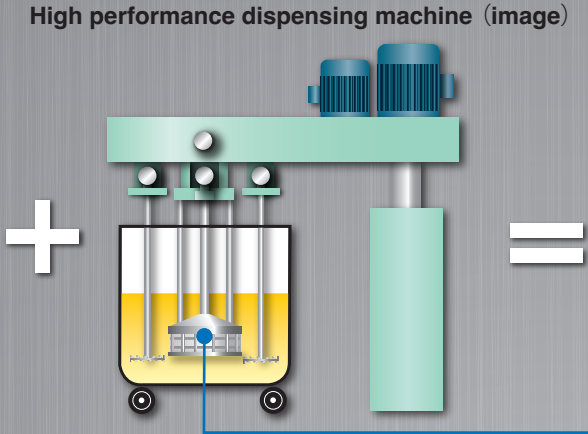
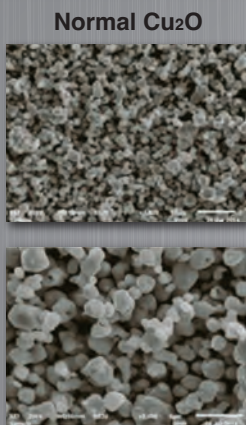
X-mile Premium is formulated with small particle cuprous oxide. It has been carefully selected by its quality as the main biocide and processed by latest highly efficient dispensing equipment under strict quality control at centralised manufacturing facility in Japan to extract its antifouling efficiently.



Normal dispensing process may not extract antifouling effect from normal cuprous oxide efficiently.



Inside of normal dispensing machine



Persistent adherence to high quality

Combination of small particle Cu₂O and high performance dispensing machine can increase surface area of Cu₂O and give full antifouling effect to its abilities.



Zirconia beads installed in inner casing

- Fining
- Efficiency
- Antifouling performance

- Increase of biocide's surface area
- Early activation of biocide
- Improved effect of biocide
- Antifouling effect just after immersion
- Effective to micro-fouling at static condition

Synergy with evolved silyl polymer can maximize its antifouling performance

Newly Developed Low-friction Primer / Binder Coat

The development of low-friction primer and binder coat has strengthened the effect of reducing friction resistance of paint system from initial stage of voyage in combination with *X-mile Premium*.

New Low-friction Epoxy Anticorrosive Primer : *X-mile AC*

New Low-friction Epoxy Binder Coat : *X-mile Surfacer*

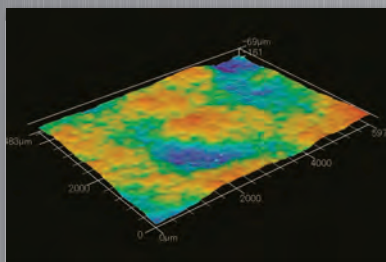


Condition after applying X-mile AC & Surfacer
(Reflecting wood block on paint film surface)

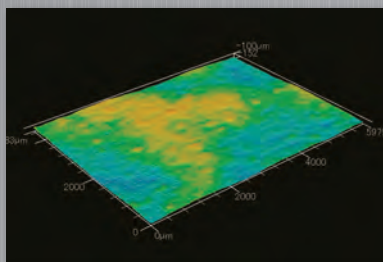


Condition after applying 2nd coat of X-mile (AF)

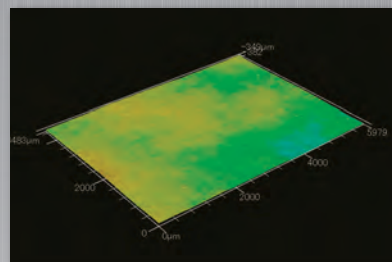
■ Surface Roughness of Paint System by 3D Graphics



Normal primer/binder coat
+ TAKATA QUANTUM



Normal primer/binder coat
+ TAKATA QUANTUM *X-mile*



Low-friction primer/binder coat
+ *X-mile Premium*
(*X-mile Premium System*)

Hull condition of coastal vessel applied with low friction primer/binder coat after 12 months

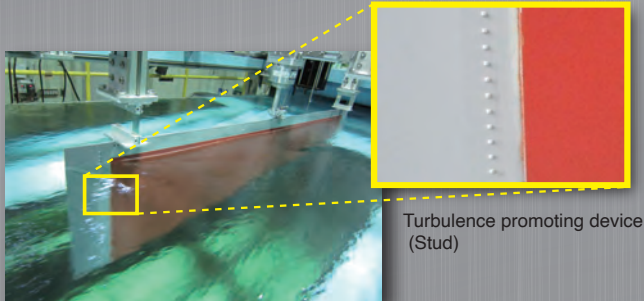
* Sound paint film condition as well as excellent antifouling performance



Demonstration at Yokohama National University, Japan

At the experiments by Circulating Water Channel at Yokohama National University, further 3% reduction in frictional resistance by *X-mile Premium* System was proven in comparison with the system of normal primer/binder coat and TAKATA QUANTUM *X-mile*.

Experiment by Circulating Water Channel



Turbulence promoting device (Stud)



KANSAI PAINT MARINE CO.,LTD.

Yokohama National University Graduate School Faculty of Engineering Division of Systems Research



Professor Mr. Takanori Hino
Doctor of Engineering



Professor Mr. Kazuo Suzuki
Doctor of Engineering

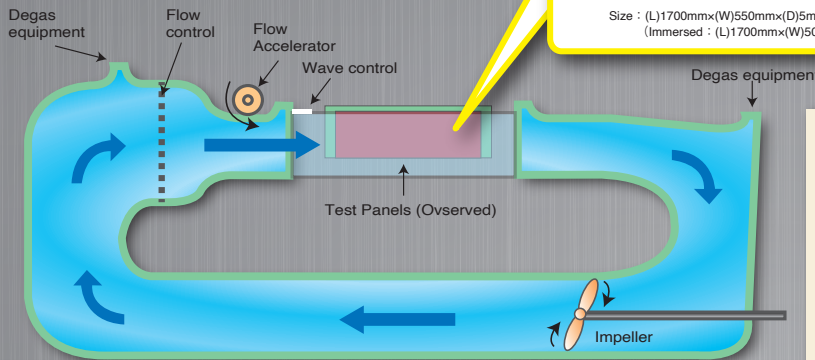


Mr. Isao Okada
Engineering Specialist

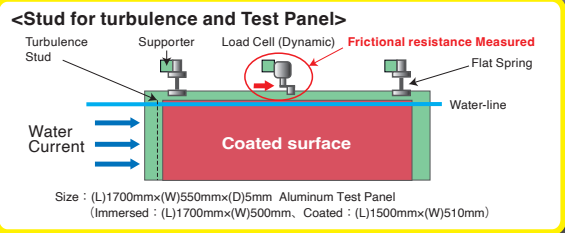
X-mile Premium

Measurement & Analysis Method

< Circulating Water Channel >



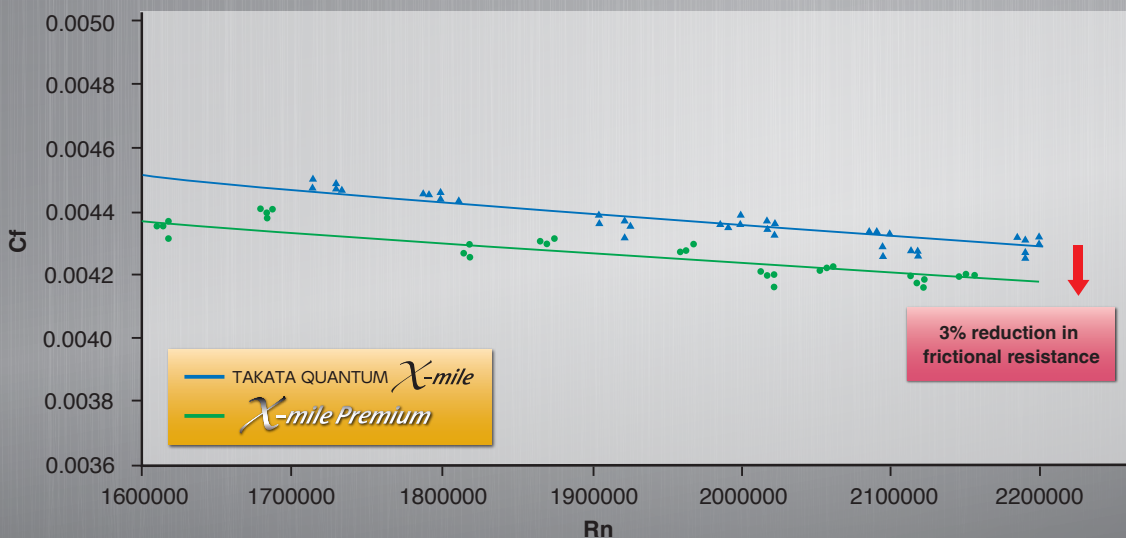
Size : (L) 7m x (W) 1.8m x (H) 2.6m Water : ca 15ton
 Test panel : (L) 3.0m x (W) 1.2m x (H) 0.85m (Depth) 0.6m
 Water Current (Max) : 1.0m / sec



Comments from Professor Suzuki & Professor Hino

From the resistance tests for a number of flat plates with various coatings, it is confirmed that there are distinct differences of frictional resistance due to the surface roughness of coatings.

Measurement results of friction resistance by Circulating Water Channel at Yokohama National University, Japan



X-mile Premium System - Product Line Up

X-mile Premium has a wide range of products to meet various vessel operation patterns.

Antifouling Paint

Product Name	Color	Package	Type
<i>X-mile Premium 101</i>	Maroon , Brick	20kg · 16L	Ocean-going vessel, Slow erosion
<i>X-mile Premium 102</i>	Maroon , Brick	20kg · 16L	Ocean-going vessel, Moderate erosion
<i>X-mile Premium 103</i>	Maroon , Brick	20kg · 16L	Ocean-going vessel, Fast erosion
<i>X-mile Premium 105</i>	Maroon , Brick	20kg	Coastal vessel, Slow erosion
<i>X-mile Premium 106</i>	Maroon , Brick	20kg	Coastal vessel, Moderate erosion
<i>X-mile Premium 107</i>	Maroon , Brick	20kg	Coastal vessel, Fast erosion

Low-friction Primer / Binder Coat

Product Name	Color	Package	Type
<i>X-mile AC</i>	Gray , Brown	20kg Set	Low-friction Anti-corrosive Primer
<i>X-mile Surfacer</i>	Ochre	16kg Set · 14 L Set	Low-friction Binder Coat

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