

# Cleaning of Intersleek<sup>®</sup> using Caviblaster Equipment at HMS Naval Base Devonport

05/08/2009  
Trevor Solomon

## Marine Coatings

---

All products supplied and technical advice or recommendations given are subject to our standard Conditions of Sale.

Registered in England No. 63604  
Registered Office 26th Floor, Portland House, Bressenden Place, London SW1E 5BG  
Page 1 of 8



## Cleaning of Intersleek<sup>®</sup>700 using Caviblaster Equipment at HMS Naval Base Devonport

### Author

Trevor Solomon, Intersleek Senior Product Manager

### Summary

Five panels coated with Intersleek<sup>®</sup>700 were cleaned by MOD divers in their training facilities at HMS Naval Base Devonport, UK using a 2,200psi underwater cavitation system from Caviblaster supplied by Charles Cleghorn.

Three of the panels had been purposefully prepared for this trial at the Felling laboratories of International Paint and immersed for conditioning at the Newton Ferrers antifouling testing site in Devon. Two further panels were selected from existing immersion tests which had extensive marine growth.

The front left hand side of the first three panels were cleaned using the cavitation equipment to allow comparison on the same board between the cleaned and uncleaned surfaces. Cleaning the thin biofilm was slow but was no different than other mechanical techniques. After the trial, one panel was despatched to Singapore and another to Newton Ferrers for fouling assessment with the third panel sent back to the Felling laboratories and the surface analysed for any signs of damage.

The remaining two heavily fouled panels were fully cleaned using the cavitation equipment. The removal was found to be very quick (estimated at less than 20 seconds) with no apparent damage to the underlying coating from the fouling removal. These panels were also sent to the Felling laboratory for closer examination.

A spare panel was purposefully scored using a knife and the diver instructed to try and remove the coating using the cavitation equipment. The purpose was to mimic cleaning of damaged coatings on underwater hulls. The equipment failed to remove any of the coating.

In the laboratory, no damage due to the cavitation equipment could be found under high magnification (x40) on any of the panels.

The antifouling assessment will continue for the next 6 months to determine whether there is any adverse effect on the performance of the coating due to the cleaning equipment.

Copies:

#### **International Paint Ltd**

Steve Ferriday  
Mathew Goodall  
Robert Leslie  
HS Lim  
Andrew Seales  
Paul Westcott  
John Willsher

#### **MOD**

Iain Blair

#### **Charles Cleghorn Ltd**

Charles Cleghorn  
Martin Craven

### Marine Coatings

All products supplied and technical advice or recommendations given are subject to our standard Conditions of Sale.



## Introduction

International Paint were invited by Ian Blair (In Water Maintenance and Repair) of the MOD to assess the underwater cleaning capability of the Caviblaster underwater cavitation system supplied by Charles Cleghorn and to see whether it would damage the Intersleek<sup>®</sup> foul release systems.

The trial took place at the MOD Marine Salvage Unit dive training facility at HM Naval Base Devonport, Plymouth.

## Trial Details

The trial followed a procedure developed by International Paint to assess commercial underwater cleaning companies and their equipment for the safe cleaning of Intersleek<sup>®</sup> foul release coatings. This is important as the coatings can be easily scratched and damaged when traditional cleaning methods are employed.

1. Part clean panels coated with Intersleek<sup>®</sup> which have been conditioned in seawater and preferably fouled with the cleaning equipment
2. Assess the cleaned areas under high magnification in the laboratory for any visible signs of damage
3. Immerse the panels on a static raft and assess for fouling growth patterns which would indicate damage from the equipment

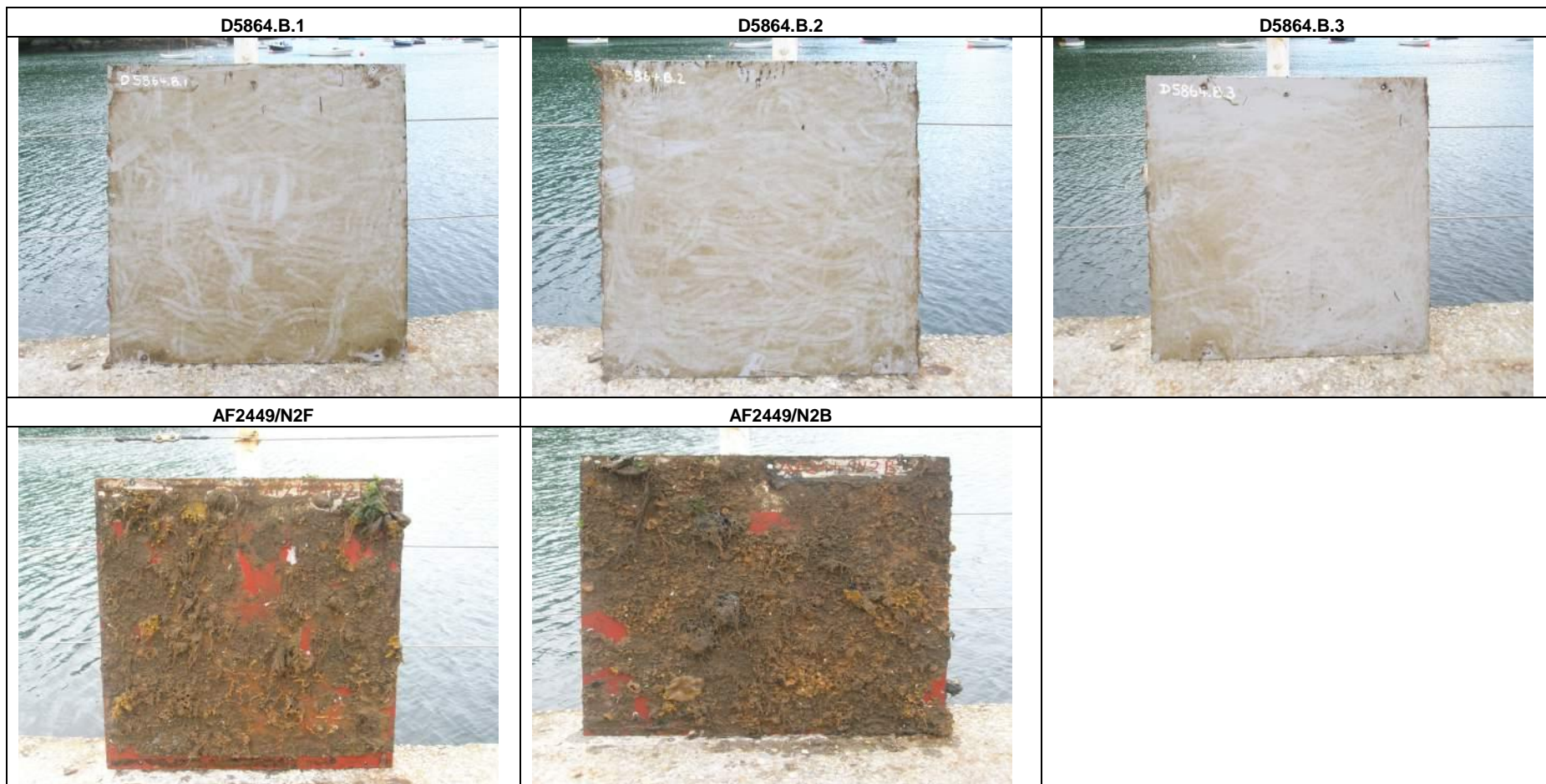
## Initial Condition of the Panels

Five panels were selected for testing as follows:

D5864.B.1	Purposefully prepared for the trial and immersed at Newton Ferrers for 1 month
D5864.B.2	
D5864.B.3	
AF2449/N2F	Selected from redundant test programmes that had been immersed for 5 years at Newton Ferrers
AF2449/N2B	

## Marine Coatings

All products supplied and technical advice or recommendations given are subject to our standard Conditions of Sale.



Panels D5864.B.1, 2 and 3 all had a light biofilm.

Panels AF2449/N2F and B had heavy coverage of various fouling organisms (bryozoan, sponges, hydroids, tubeworms, barnacles, muscles and limpets).

## Marine Coatings

All products supplied and technical advice or recommendations given are subject to our standard Conditions of Sale.

Registered in England No. 63604

Registered Office 26th Floor, Portland House, Bressenden Place, London SW1E 5BG

Page 4 of 8



## Caviblaster Equipment

The equipment used was the 2,200 psi petrol model.



Compressor



Gun

## Trial Results

### Panels D5864.B.1, 2 and 3

The biofilm layer present on these panels was very light and as such would not normally be subjected to underwater cleaning. Thin biofilms are generally harder to remove from the surface and it was felt that mechanical methods normally employed would have encountered difficulty in removing this layer.

Unsurprisingly, the Caviblaster equipment was slow and struggled with removing the biofilm. However, with practice and through making slower and more passes, the diver was able to remove more of the biofilm. At the speeds necessary though, everyone agreed that this would not be a commercial option for removal.

As each panel was cleaned, the half of the panel cleaned was visually assessed for any signs of damage; none could be found.

## Marine Coatings

All products supplied and technical advice or recommendations given are subject to our standard Conditions of Sale.



## Marine Coatings





All products supplied and technical advice or recommendations given are subject to our standard Conditions of Sale.

### Panels AF2449/N2F and B

The fouling removal from these panels was very quick, due in part to the ability of the Intersleek® systems to inhibit strength of adhesion of fouling and the equipment itself.

Though not measured, it is estimated that one panel was cleaned in less than 20 seconds.

After cleaning, the panels were visually assessed for damage; as previously, none could be found that could be attributed to the cleaning equipment.

	AF2449/N2F	AF2449/N2B
<b>BEFORE</b>		
<b>AFTER</b>		

### Marine Coatings

All products supplied and technical advice or recommendations given are subject to our standard Conditions of Sale.



As the Caviblaster equipment appeared unable to damage Intersleek®, a further panel was purposefully scored completely through to the plywood using a knife and the diver was instructed to try and remove the coating. After five minutes, it was apparent that the equipment would not remove any of the coating away from the damage areas.



## Further Assessments and Results

The test panels have been assessed further as follows:

D5856.B.1	Immersed at Singapore for accelerated fouling
D5856.B.2	Immersed at Newton Ferrers for UK fouling
D5856.B.3	Assessed at Felling under high magnification
AF2449/N2F	Assessed at Felling under high magnification
AF2449/N2B	Assessed at Felling under high magnification

At this time, only high magnification examination results are available; fouling assessment will continue for several months.

All panels were closely examined under an optical microscope at a magnification of x40. No damages could be seen.

## Conclusions

The conclusions that can be drawn from this work are as follows:

1. The facilities available for this trial were excellent and perfect for the task.
2. The caviblaster equipment was able to remove the thin biofilm on the Intersleek® surface but was slow. This would not be a commercial option for this type of biofouling (though in reality the layer would not normally be removed).
3. The caviblaster equipment removed the heavy fouling with ease, partly due to the foul release properties of the coating and partly due to the equipment itself.
4. The caviblaster equipment did not appear to cause damage to the surfaces of any of the panels and was unable to remove coating when there was a defect.