

Aging Aircraft & Sustainability Conference  
Wednesday, 19<sup>th</sup> July 2017



## Aircraft Airworthiness & Sustainment Conference



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## Part A

The Lesson

## Part B

What was learnt





At the AA&S Conference 2012, the  
following presentation was given:





## Aircraft Airworthiness & Sustainment Conference



Advantages of airframe cleaning using  
foam application of detergents

Charles D. Cheesman



**AIRCRAFT AIRWORTHINESS AND SUSTAINMENT  
CONFERENCE**  
AUSTRALIA 2012

[www.bionwatersynergetics.com.au](http://www.bionwatersynergetics.com.au)



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A recap of what was offered  
in that presentation





## **What do we mean by: “Foam Application of Detergents”?**

**It is simply, applying detergent to the  
airframe in a foam pack, rather than in an  
aqueous solution.**



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## **Cost Advantages are achieved by:**

- **Reduction in labour – man hours**
- **Reduction in product usage**
- **Reduction in ongoing maintenance**







## Reduction in labour – man hours

Significantly reduce time  
required to apply product  
to airframe.





## **Reduce amount of time required to remove contaminant from airframe.**

- Material applied as a foam pack does not dry as fast as aqueous solutions.
- The foam pack has a different cleaning action than aqueous solutions. It lifts the contaminants better from the surface being cleaned and suspends them.





## **Reduction in product usage**

- Reduces Wastage
- Stays on airframe
- Usage on demand, nothing is mixed and thrown away
- Product is mixed in correct proportion





## Reduction in ongoing maintenance

- Less wear and tear on components  
(Due to better removal of dirt, metal fines & carbon)
- Reduces wear by abrasion & binding
- Due to low pressure application will not over-wash hinges and bushes.
- Will not penetrate seals and rod ends
- Improved corrosion control – Only if correct cleaners are used.



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# **Practical Considerations in Application of Detergents as a Foam**





The most important detail is to draw  
a distinction between  
foam and frothy water.





Good foam is less than 1/10 the density of water



=





# This is NOT foam application!







- **This is NOT foam.**
- **This is an example of well frothed water.**
- **The viscosity is only slightly better than water out of a bucket.**





## Another Example of foam or water.





**This allows the foam to hang on vertical and upside down surfaces and slows the rate of drying.**







# Contents

## Part B

What was learnt







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**Note:**

The results in the  
following examples were  
attained using Zi-400  
aircraft cleaner



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# Why Zi-400

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**It has been scientifically demonstrated that Zi-400**

- ✓ **Meets/exceeds OEM specifications**
- ✓ **Performs well with foam application**
- ✓ **Prevents corrosion**
- ✓ **Arrests existing corrosion**







**It has been scientifically demonstrated that Zi-400**

**✓ Prevents corrosion**

**✓ Arrests existing corrosion**

Testing done by Professor Bruce Hinton

References:

DSTO Report 7/93

Deakin University Technical Report T-C0098-1

AASC Presentation 2016 - "Corrosion Prevention with Aircraft Washing Detergents"





## **Case 1. ~100 PAX commercial airliner.**

Original procedure per wash:

**27 Man Hours Labour**  
**31 Litres of aircraft cleaner**  
**Corrosion evident on airframe**

Foam/Zi-400 wash Procedure

**11 Man Hours Labour**  
**8 Litres of Aircraft Cleaner**  
**NIL further Corrosion on airframe**





## Case 2. 9 PAX GA aircraft.

Original procedure per wash:

**2.5 Man Hours Labour**

**6 Litres of aircraft cleaner**

**Some Corrosion evident on airframe**

Foam/Zi-400 wash Procedure

**1.5 Man Hours Labour**

**3 Litres of Aircraft Cleaner**

**NIL Corrosion evident on airframe\***

**\* New wash procedure implemented after strip and repaint**





### **Case 3. 6 PAX Rotarywing.**

Original procedure per wash:

**2.25 Man Hours Labour**

**5 Litres of aircraft cleaner**

**Slight Corrosion evident on airframe**

Foam/Zi-400 wash Procedure

**1.5 Man Hours Labour**

**2 Litres of Aircraft Cleaner**

**NIL Corrosion evident on airframe\***

**\* New wash procedure implemented after strip and repaint**





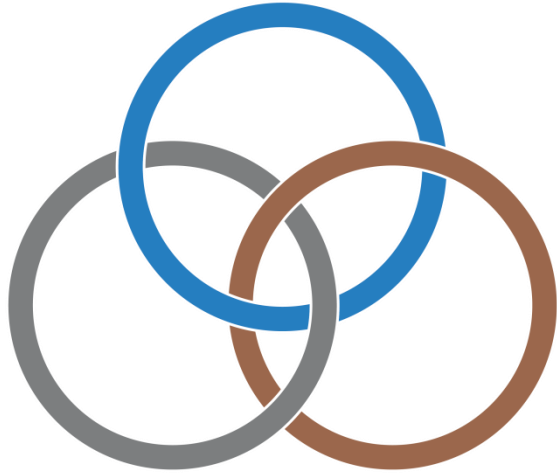
# A summary of the method discussed:



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**Any  
Questions?**

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