

**Aquamax**  
HYDROBLASTING

# Aviation Capability

for taking it off



# We take it off

**We remove:**

**coatings**

**paint**

**corrosion**

**contaminants**

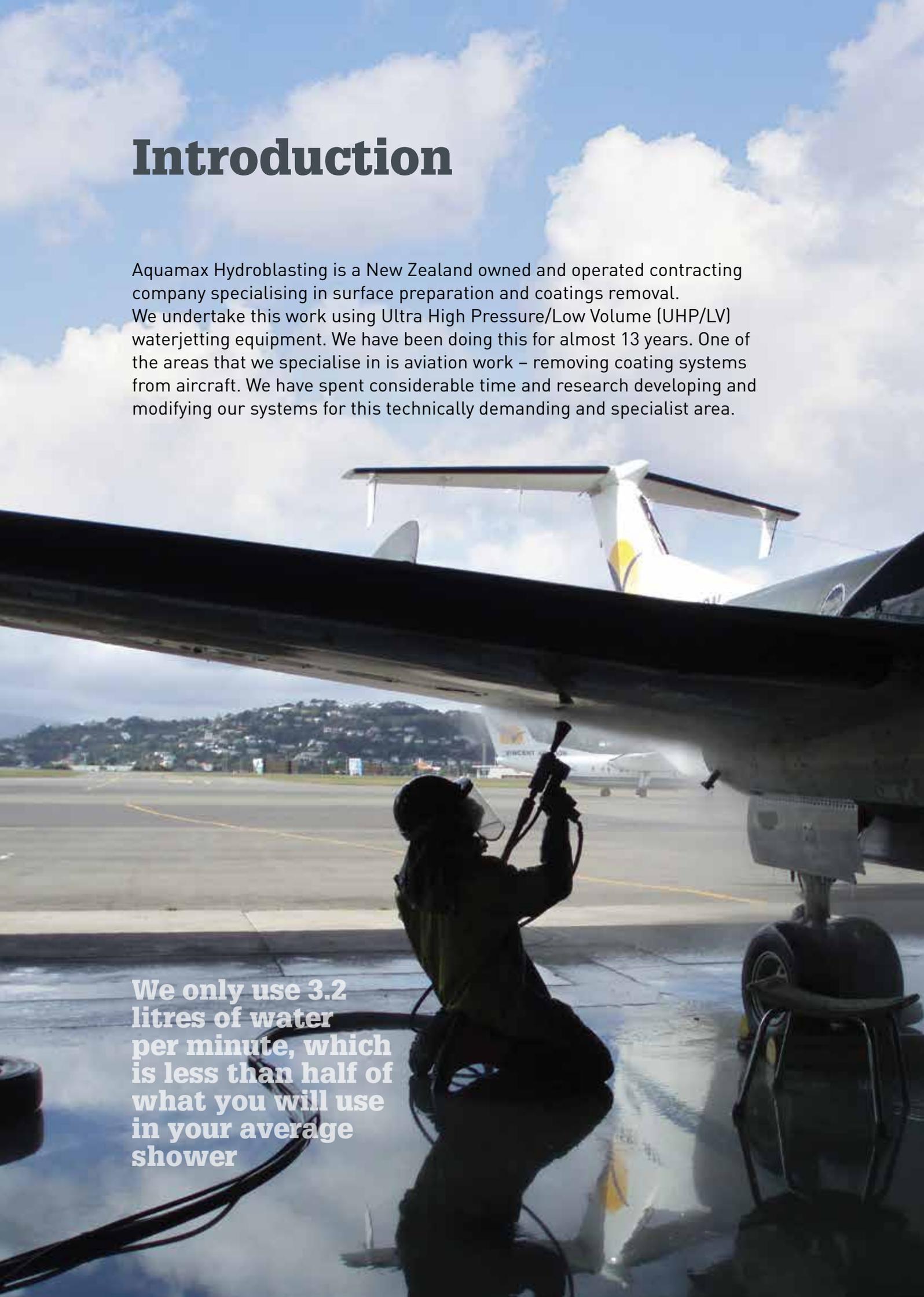
**& your problems**

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# Introduction

Aquamax Hydroblasting is a New Zealand owned and operated contracting company specialising in surface preparation and coatings removal. We undertake this work using Ultra High Pressure/Low Volume (UHP/LV) waterjetting equipment. We have been doing this for almost 13 years. One of the areas that we specialise in is aviation work – removing coating systems from aircraft. We have spent considerable time and research developing and modifying our systems for this technically demanding and specialist area.

A worker in silhouette is using a high-pressure waterjetting tool to clean the underside of an aircraft wing. The worker is wearing a full protective suit and a helmet. The aircraft is parked on a tarmac, and the background shows a clear blue sky with scattered clouds and a residential area in the distance. The waterjetting process is creating a mist of water droplets around the nozzle.

**We only use 3.2 litres of water per minute, which is less than half of what you will use in your average shower**

# Conventional coatings removal processes

The current certified method for removing coating systems from aluminium aircraft surfaces is to apply large quantities of chemical solvent strippers, which are then manually removed by scrapers and abrasives.

This method has several inherent problems that have concerned those in the aviation industry for some time.

## PROBLEMS

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- Permeation of the solvent stripper into the lap joints in the aircraft skin and under rivet heads, which leaches out later on, damaging the new paint surface
- The use of hard stripping tools that can damage the aircraft skin
- The difficult and time-consuming removal of oxides and old paint from rivet edges
- The detrimental health and safety and environmental impacts of the process

Alternative methods of aircraft coatings removal have been developed in attempts to eliminate some of these problems, but in most cases they have either addressed only one of the issues or they have caused other problems.

## ALTERNATIVE METHODS

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### **Bead blasting**

This can be undertaken on rivets, but is considered unsuitable for the entire aircraft due to financial cost, and the associated issues of air-drifting paint dust and the sensitivity of lighter skins on control surfaces. This process also requires perspex windows to be masked.

### **Standard Ultra High Pressure waterjetting**

The downward pressure produced by this equipment when operated at the required level to strip paint causes the aluminium skin to stretch between secured points. The resulting distortion to the control surface and the large amount of 'oil canning' is totally unacceptable to aircraft engineers.



**10 hours of hydroblasting  
would take 2-3 people  
a week using conventional  
chemical strippers**

# The Aquamax process

Aquamax can guarantee the removal of the entire coating system back to the sound substrate, including the previously difficult problem areas surrounding rivet heads and lap joints, where conventional paint stripping methods have caused most concern.



Over the last 8 years, Aquamax has successfully completed surface preparation on 135 aircraft throughout New Zealand. These jobs have involved coatings removal as well as filiform corrosion excavation. Aquamax operators have more than 4350 hours' experience in the removal of surface coatings from aircraft.

The company has established procedures and standards that are recognised throughout the industry as being of a very high standard.

Our technology is the result of extensive research conducted in close association with universities and government agencies in both New Zealand and the United States.



This research has involved the installation of test rigs in universities, and research has shown that the Aquamax process causes no surface damage or stretching of panel skins and that the Alclad coatings remain intact.

Aircraft engineers have also been very impressed with the ability of the process to excavate the filiform corrosion that is often encountered when coatings are removed. The corrosion is easily excavated using a specially designed blasting nozzle that focuses on the affected areas without damaging the oxidated surface. The process totally eliminates the need to use chemicals or abrasives and sandpaper around these delicate areas.

Aircraft engineers and experts in the aviation industry have inspected the results of the Aquamax process on aircraft, and have come to the following conclusions about the benefits of the Aquamax process.

## **BENEFITS**

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- There is no distortion to any surfaces stripped of coatings.
- All rivets are totally clear of edgeline coatings and oxides.
- There is no scratching or damage to the aircraft windows.
- The small amount of waste is easily contained, managed and disposed of.
- Results can be achieved a lot quicker than using conventional chemical strippers – the equivalent results from 10 hours of hydroblasting would take 2–3 people at least a week.

# How Aquamax operates

Aquamax has developed the successful and sophisticated Aquamax aviation process, with the pumps and guns specifically modified for the demands of aviation work.

The very low blast thrust and dwell times achieve surface preparation on delicate skins without distortion, despite emitting water at pressures of up to 45,000 psi. The higher rotation speeds of these hydroblasting guns increase the removal rate of the coatings and greatly lower the potential to scuff the surface.



Each of our mobile units is fully self-sufficient, holding 1800 litres of water, which enables 8 hours' blasting time. The pump units use only 3.2 litres of water per minute.

The water is filtered through a two-stage system to 0.3 microns. The use of pure filtered water, without any additives or chemicals, eliminates the possibility of leaching damage to the newly applied coating.

The small amount of wastewater is easily contained and disposed of without adversely affecting the environment. All residues are wet vacuumed up and stored in waste containers before being disposed of by certified waste management companies.



Our operators are highly skilled. Each has a minimum of 24 months' experience working with UHP/LV equipment before being rigorously assessed and trained to undertake work in the specialised aviation application area.

All Aquamax operators hold the required New Zealand Police and Ministry of Justice security clearances and have been inducted to work on all New Zealand international and regional airports.



# Case studies

## Cessna 185, Drake Aviation

This project was completed in March 2008. It involved the careful removal of the original factory assembly coatings under the guidance of the client, Bruce Drake. The stubborn primer coats made the job more difficult than usual, but quality was never undermined to achieve the desired result.

To quote the satisfied client, "It would have taken me at least 80 hours of work to strip a Cessna 185 on my own. Even then it wouldn't have been ready to prime and paint like this one was. I wouldn't hesitate to get Aquamax back to do any jobs in the future instead of chemical stripping – you can't even compare the two jobs!"



## Fletcher Cresco, Wanganui Aeroworks

This project involved an Ag-Aircraft with loads of filiform corrosion and ceramic undercarriage coatings that were required to be removed by the highly skilled Aquamax operators using the waterjetting process.

Due to the tight schedule requirements of the client, extensive hours were worked over the weekend to complete the project in full, on time and in specification.

The client was delighted. To quote Rob Hartnell, Engineering Manager, "Where do you get these guys from? How can we clone them for our operations?"



A worker in a high-pressure water suit is hydroblasting the fuselage of an aircraft. The worker is wearing a dark green helmet, a black protective suit, and orange boots. They are standing on a metal ladder and using a high-pressure water gun. The aircraft is white with yellow and blue accents. The background is a clear blue sky.

# Conclusion

Aquamax Hydroblasting is the only process for the removal of paint and corrosion from aircraft that delivers the results required without the detrimental side effects.

Please contact us for further information or for an obligation free consultation.

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**Our mobile units hold  
1800 litres of water  
which enables 8 hours  
of hydroblasting**

# Aquamax's aviation history

Over the last 8 years, Aquamax has removed the surfaces of the following range of aircraft:

## Cessnas:

Cessna 150/152	3
Cessna 172	11
Cessna 180	4
Cessna 185	4
Cessna 206	1
Cessna 208	1
Cessna 402	1
Cessna 406	1

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**TOTAL** **26**



## Pipers:

Piper Aztec	1
Piper Seneca 1	1
Piper Chiefton	1
Piper Warrior II	6
Piper Tomahawk	6
Piper Cherokee 6	3
Piper Seminole	1
Piper Archer	1
Piper Arrow III	1

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**TOTAL** **21**



## Commercial:

Britten-Norman Islander	6
Beechcraft 1900 C	1
Jet-stream 32	1
Dakota DC 3	1
ConvAir	1

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**TOTAL** **10**



**Helicopters:**

Twin Squirrel	8
Hughes 500	21
Squirrel	13
BK 117	3
Jet-Ranger	5
Robinson 22	2
Iroquois	1
<b>TOTAL</b>	<b>53</b>



**Agricultural aircraft:**

Fletcher	11
Partenavia	2
Crop-duster Fatman	1
<b>TOTAL</b>	<b>14</b>



**Classical:**

Sky Hawk 11	1
Comanche	1
Provost	1
L29 Albatross Jet	1
Lonestar	1
<b>TOTAL</b>	<b>5</b>



**Other:**

Aero-Commander	1
Airtourer	1
Robin	2
Beechcraft	1
Duchess	1
<b>TOTAL</b>	<b>6</b>



**GRAND TOTAL OF AIRCRAFT COMPLETED TO DATE 135**



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