

# AIRCRAFT CLEANING

// By Brendan Odell, CAA Airworthiness Inspector

Regularly washing your aircraft is the first line of defence against corrosion.

New Zealand is surrounded by oceanic winds, and it receives moderate rainfall and good lashings of UV-laden sunshine. For aircraft structures, paints and plastics, this is a pretty tough environment.

One of the easiest and most cost-friendly steps to reduce the harmful effects of salt and other contaminants on your aircraft, is simply to wash it regularly. Washing with the right materials on a regular basis can massively reduce the occurrence of corrosion.

For this reason, large aircraft maintenance programmes generally incorporate a washing schedule, which is called up for action, just like any other task on the aircraft.

When it comes to washing salt-laden structures, delay allows the unchecked onset of corrosion.

So create a cleaning schedule, based on the utilisation of your aircraft, and stick to it.

## Wet washing

If regular aircraft washing is to keep corrosion at bay and preserve the paintwork, it's just as important the products, tools and materials you use support the same goal. The last thing you want to do is wash corrosive detergent residue into lapjoints and under fasteners.

I recall some years ago, when an aircraft maintainer in the North Island sourced some very strong detergent –

normally used for cleaning industrial chip fryers – and found it very effective in degreasing aluminium surfaces, especially where carbon accumulations from exhaust gases had collected.

You can guess the results – the stuff was extremely corrosive. We were fixing major corrosion issues for years afterwards on those aircraft.

Also, as the term implies, wet washing typically involves lots of water. Mind how you use a pressure washer – the intensity of the water stream can damage aircraft paint, skin, plastics, electrical components, and so on.

Protecting sensitive components and (where specified) following manufacturer's procedures is very important.

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## Environmental considerations

If you're removing oil and carbon residue, consider the potential damage done to the environment if that residue is channelled into the stormwater system.

The runoff in stormwater pipes discharges into the nearest stream, lake, underground soakhole or beach, also potentially ending up in our groundwater aquifers. Such toxins will do their bit to threaten wildlife and ecological systems.

It could also contribute to the degradation of the quality of water used for stock watering and domestic supplies.

Therefore, for regular wet washing of a fleet of aircraft, it's appropriate (and in most cases required by council by-laws) that a wash pad is constructed and fitted with an adequately sized oil/water separator. This allows accumulated oil to be regularly and safely removed, without threatening the environment.

## Choosing your products

Use products recommended by the aircraft manufacturer. If they or recommended alternatives are unavailable, or there are no recommendations made, select a product as close to pH neutral as possible (about 7). A product with

a pH of 11, for example, will almost certainly damage aluminium, steel and various alloys.

With washing comes waxing. Many aircraft manufacturers recommend commercially available waxes. Avoid using any kind of orbital polisher on and around protrusions such as static ports, rivets, hinges, doors, corrugated metal surfaces, and antennas.

Make sure you cover the static ports, vents, pitot tube ends, and antennas before you start washing or waxing. Remember to remove anything covering these after washing and waxing. Ensuring drain holes in flight controls, fuselage and other areas are clear will make sure that the very contaminants you want to remove, drain safely away.

As your aircraft's paint ages, or if your aircraft sits outdoors for an extended time, you need to be even more diligent with surface cleaning and protection.

Abrasion, caused by normal environmental contaminants, will eventually create micropits in the paint's surface, which will trap dirt and moisture.

That combines to further accelerate paint degradation. This can be mitigated with regular washing – in New Zealand conditions, about every 30 days is a good starting point. »



Photo: CAA/Pen Mackay.

// Regular washing of your aircraft will keep corrosion at bay and preserve the paintwork.

## » Dry washing

Giving your aircraft a bath may not be possible on some airfields for environmental reasons, or because of limited access to water. (Washing an aircraft does use a tremendous amount of water. On large aircraft, the numbers are staggering – more than 9,500 litres of water to clean a Boeing 777 and more than 11,300 litres of water to clean an Airbus A380!)

Luckily these large aircraft receive water washes only four or five times a year. The rest of the time they undergo dry washes – something that's an option for all types of aircraft.

As indicated by the name, little or no water is used. A liquid cleaning product is first applied manually to the entire external surface of the aircraft. Typically, clean microfibre fabric is then used to remove the cleaning product which

has dried to a film, removing the dirt along with it and leaving the aircraft clean and polished.

Dry wash materials are applied with spray, mops or cloths, and removed by dry mopping or wiping with clean, dry cloths. The aircraft is left with a fine protective film allowing the painted surface to retain a longer-lasting gloss and shine. It's important to understand that the dry wash method of aircraft cleaning isn't suitable for removing heavy deposits of carbon, grease, or oil, especially in the engine exhaust areas.

Remember – keeping your aircraft clean is the first line of defence against corrosion, so do it regularly and properly. The benefits outweigh the hard work! ➔

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## // ADVICE FROM THE PROFESSIONAL

### The windows

Todd Hooper, CEO of aircraft cleaning company Kiwi Shine Worx, says windows need to be treated with extreme care.

"Don't go aggressively at trying to remove bug carnage from the windows, including using excessive pressure. Light daily cleaning should avoid the bug acids and proteins etching into the windscreen surface.

"This can be done by simply leaving your approved cleaner soaking the window, then do a first wipe with nil or low hand pressure, gently removing soaked and loosened debris. Follow up with a second application of the cleaner and give it another wipe, then wipe dry.

"Always use an up-and-down wiping and drying motion – a circular motion can scratch the window, possibly distorting your view outside, particularly in the sun. Use a high-quality cleaning towel, such as a 1100 GSM microfibre cloth."

### The interior

Todd says cleaning the aircraft interior needs as much care as with the exterior.

"There's a huge range of interior materials – from fabric to timber to vinyl – all of which fatigue over time," he says.

"Those materials are prone to a huge number of contaminants such as UV rays, dirt, dust, oils – including body oils – stains and spills, and moisture. If you use the wrong cleaner, perhaps full of damaging chemicals, that contamination can speed up, leading to premature fatigue of the materials. And replacement or refurbishment can be expensive."

Todd also says to follow the aircraft manufacturer's instructions and do your research before first lifting a cloth.

"You've got to be careful with fabric cleaning products because, at altitude, some chemicals can produce vapours.

"Fire retardant properties of aircraft interior materials can also be adversely affected by the application of inappropriate cleaning products."

He also recommends using gloves and eye protection to prevent any possible reaction to the product.

"Also, with COVID-19 almost part of our day-to-day, some commercial interiors could possibly need more of a regular cleaning schedule."

Todd says not all interior areas need the same degree of 'decontamination'. "The cockpit can be subject to pretty heavy contamination," he says. "But the baggage area usually needs only a light detail."