

## Lord Bart-Jan Mathot of Loch Leven and Glencoe

Paul

Over 30 years ago now, both Cranfield Aeronautical Institute as well as NASA came out which what now would be defined as a "white paper" as both independently had done some research and testing in regards to the relation of a clean aircraft and fuel consumption.

We both know that the industry then was already crying wolf about the fuel costs, so if that in those days was a somewhat minor issue it should not be today, as for instance the savings on fuel consumption would automatically have its effects in the carbon footprint of that particular aircraft. My personal research involved studying the origin of the dirt that settled on the skin of an aircraft, which led to the following conclusion:

Dirt accumulation on the skin of an aircraft has a multiple of factors, that would change from aircraft to aircraft, factors being: Climate, route, type of aircraft, hours in the air, hours on the ground, speed, overland, oversea, weather type, season, cleaning frequency and there are at least another ten factors that ultimately will decide how dirty the aircraft involved is, or will be.

We found an operator willing to work with us and we invested into chartering "Dass Koelnisches Wasseramt" ( the water laboratory of Cologne, Germany) to be present at a wash of an F-27 Fokker Friendship and take samples of the materials we used in different solutions, next to taking samples of what was coming of the aircraft. We also got hold of the company that had developed a wax coating for high performance Mercedes-Benz vehicles who was willing to work with us.

The test was performed at Cologne/Bonn International airport and the report that I received a fortnight later would have any environmentalist scream for bloody murder and start a campaign to stop this madness of using aircraft at all, as the affluent hitting the sewer systems had amongst the normal grease and grime, that already were over the norm, heavy metal residue that exceeded the norm with factor 1000 +, and we knew that we were sitting on a time bomb.

After the wash, we applied the wax in order to fend off any dirt settling on the paintwork, but after only two weeks we saw that something as small as probably a mosquito must have hit the radome and subsequently 'breached' the coating resulting, as we were monitoring this aircraft on a daily basis, in this coating starting to get pushed back like a 'turtle neck' and within 4 weeks this had settled right in front of the wings, around the fuselage and our attempts to remove it took more than a day. .

Equipped with that knowledge, we set out to find a system that would simply not allow the aircraft to get dirty and and we used that system with astonishing results.

***Not only did we need less cleaning agents, but we used less water, less manpower, less electricity on our machinery and tests even showed that we were able to bring down fuel consumption, depending on the type of aircraft, of up to, and in some case more than 5%, which at today's rate would also imply a reduction of the carbon footprint of the same magnitude.***

We also took a hard look at our personnel and changed the way of dealing with them, changing our human resources and training department totally, upgrading training programs, to the effect that our personnel would have even type ratings on certain aircraft that are short of being qualified mechanics and a pay that is in line with that.

On the paperwork we actually provided our clients with what we called a "Status & Compliance Report, which in effect tells client that we are in line with procedures involving the maintenance of the aircraft and make notifications as to the state of the aircraft as we received it, what we did to it and the level that we return it back.

Now that was over 28 years ago and as we settled on Brussels International Airport, we soon became quite well known by the users of that airport as top specialists, our website showing that 'top rated' companies used our services

By the way, one thing I had not mentioned about the cleaning test; I requested the lab to give me an estimate of the amount of dirt, grease and grime that might come from the aircraft and the results were mind blowing: It was calculated that that Fokker F-27 Friendship, had in excess of 60 kg attached to it, which if one would take it to the extreme would add an extra passenger to the weight load, that was not in anyway registered, which can be translated both as loss of revenue as well as a hazard regarding maximum carry weight.

Hope to hear from you.

BJM

**(Lord Bart-Jan can be reached at [B-J.Mathot@aaawa.aero](mailto:B-J.Mathot@aaawa.aero) should you require more information or have any comments)**

BJ.

I thank you for allowing me the use of your experience and knowledge. Of particular interest is the results of the research in the amount of residue, (dirt, grease & grime) that comes off the paint after a proper cleaning. Although we have no numbers or studies to substantiate otherwise, but a Deep Cleaning/Polishing of the exterior surface should remove even more deep set grime ,without affecting the "hardness", (or "life") of the paint. The system makes use of readily available labour with minimal training, (mainly "safety" for the workers). I have been trying for years to explain the ineffectiveness of applying "waxes" to an aircraft exterior surface, in durability, viability and "increase" in weight. A simple and proper cleaning of the paint itself is the simplest, most inexpensive, least damaging, longest lasting, and quickest way to address this problem all while adding O (ZERO) weight with the added bonus of reducing or eliminating corrosion & erosion. The paint itself is without a doubt the most durable and viable "coating" available. Keeping it clean should not require any harsh cleaners and "Protecting" the paint with "Paint Protectors" is really unnecessary and actually, counter - productive. ***A routine "proper" cleaning of the exterior will quickly and inexpensively solve these issues and afford much more efficient savings in all cleaning products used and maybe most important of all efficient use and savings of that most precious of commodities these days....fuel.***

Please let me know if you agree or have anything to add. My mission is to somehow make all the air carriers aware of the simplicity of solving the unnecessarily complicated issue of aircraft large surface cleanings.

Best Regards

Paul Embury - President ***SPEC Distribution International Inc.***

**Email:** [spec-dist@hudson.net](mailto:spec-dist@hudson.net)

**WEB:** <http://www.aircraftpolish.com>

**SKYPE:** **ACPOLISH**

**LINKEDIN:** <http://ca.linkedin.com/in/aircraftpolish>

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