

CYCLEAN



Wash

and go



Regularly cleaned engines require less maintenance and less fuel, thus protecting the environment. With Cyclean®, Lufthansa Technik has developed an engine wash that allows this previously time-consuming procedure to be completed directly at the gate – and now takes just 45 minutes.

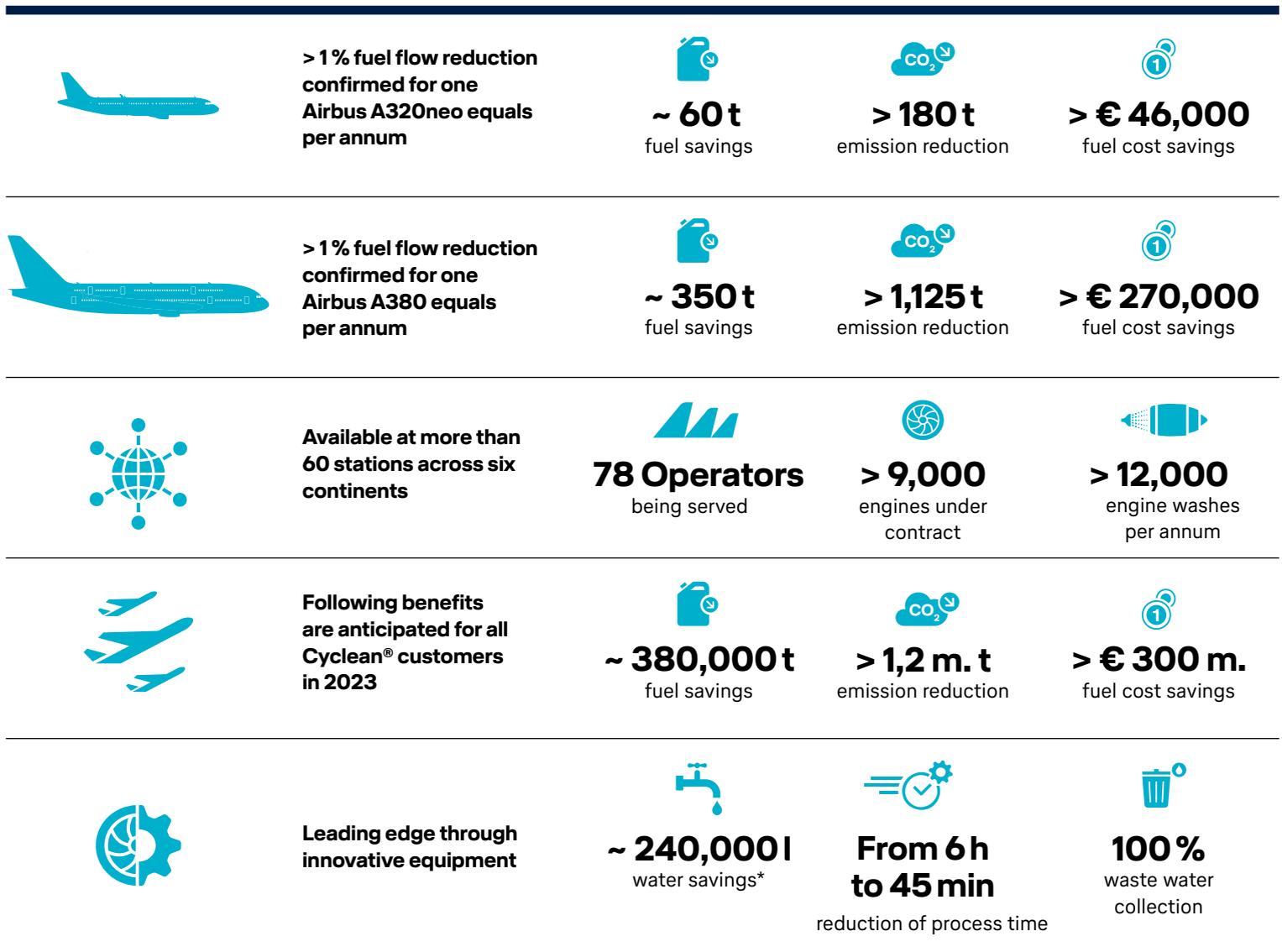


Aircraft engines are exposed to contamination each time they fly, especially during taxiing, takeoff and landing. Depending on the area of operation, an aircraft's ambient air contains sand, salts, chemicals, hydrocarbons, and other particles that collect not only on the aircraft's outer skin but also in the turbine. The technical jargon for this type of dirt buildup is "compressor fouling". Over time, the accumulated dirt forces the compressor to work harder and harder to pressurize the required amount of air. This results in accelerated engine wear and higher kerosene consumption, which unnecessarily pollutes the environment and increases

The new Cycleclean® procedure reduces the duration of an engine wash from 6 hours up to 45 minutes.

engine maintenance costs. The good news is that most of this contamination can be removed. To do so, however, the turbines have to undergo regular, thorough cleaning – about two to five times a year. A frequency that can quickly become costly for operators with multiple aircraft.

The proven Cycleclean® effect



*compared to competing products

The continuously growing Cyclean® network



When performed regularly, Cyclean® engine wash helps to save more than 1,2 Mio. tons of CO₂ emissions per year within our operators network, which is a substantial contribution to achieve their sustainability goals.

Mobile washing system for engines

This prompted Lufthansa Technik to develop Cyclean® engine wash, a process that, when used regularly, ensures engines work more efficiently and consume an average of up to one percent less kerosene for the same power output. Cyclean® primarily differs from other engine washing methods in that its cleaning cycle is extremely short, averaging just one hour - and on some engines, such as the PW1100G, as little as 45 minutes. The process is always the same: Water is vaporized at 70° Celsius and 65 bar pressure and sprayed directly into the core engine. During this process, neither the

engine cowlings nor the fan and rear cowlings of an engine need to be opened. Nor is it necessary to separate the sense lines. Cyclean® consists of a mobile component, a spray nozzle that is screwed onto the tip of the respective engine, and a water collection system that guarantees 100 percent wastewater recovery. A technician attaches the spray adapter in a few simple steps before the wash and properly disposes of the soiled water after the process. As the adapter is operated from a vehicle, the wash can be carried out regardless of where the aircraft is parked.



A clean engine pays off

“When examining engine monitoring data for various engine types, we see that Cycleclean® washes provide significant and long-lasting benefits,” says Feliks Wandt, Head of Engine Life Cycle Services EMEA & Asia-Pacific. “In addition to a higher EGT margin and a reduction in fuel flow, customers can also benefit from increased average on-wing time.” Cycleclean® wash stations are currently available at a number of airports around the world for the most common commercial aircraft types, including new engine types such as the PW1100G/1500G and LEAP-1A/-1B. Looking ahead, Lufthansa Technik plans to increase the number of Cycleclean® service locations worldwide. “We are working continuously to expand the network,” says Florian Prinz, Head of Engine Life Cycle Services, Western Europe & America. “As a rule, we are almost always able to set up a service location anywhere in the world within about three months of receiving a customer request.”



FELIKS WANDT
Head of Engine Life Cycle Services,
EMEA & Asia-Pacific



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More than 9,000 engines are currently under contract, and more than 150,000 Cycleclean® washes have been successfully completed.

Entering the digital era

In recent years, Lufthansa Technik engineers have conducted a great deal of research and development to further enhance the customer benefits of the Cycleclean® engine wash with new technological approaches. As a result, aircraft operators can now benefit from a digital application that automates the entire engine wash process chain. Beginning with the decision to initiate a wash, planning and monitoring tasks will be carried out by a dedicated program on Lufthansa Technik's AVIATAR digital operating suite. The program tracks an individual engine's cleaning interval and determines

the right time for a wash by linking the aircraft, flight schedule and Cycleclean® stations operating worldwide. The aircraft then automatically checks in at a station, the local provider accepts the request, the plane is added to the flight plan, and the wash is conducted. A smart digital benefit that helps reduce labor-intensive planning and scheduling for operators and aircraft owners. ■

→ [Find out more about Cycleclean® in our video.](#)