

# HIGH-EFFICIENCY, LOW-NOISE IMPELLERS FOR CAR WASH SYSTEMS



 CLIENT	 CHALLENGE	 SOLUTION	 RESULTS
<p>Global leader in car wash systems and equipment</p>	<ul style="list-style-type: none"> <li>• Retrofitting car wash dryers</li> <li>• Existing plastic housing shall remain unchanged</li> <li>• Outlet air velocity shall be similar to the actual velocity (~140 mph)</li> <li>• System shall be 5 dB(A) quieter</li> </ul>	<ul style="list-style-type: none"> <li>• Highly efficient diffuser impeller</li> <li>• Corrosion-resistant aluminum design</li> <li>• Airfoil blade geometry for optimized sound</li> <li>• Specially adapted inlet cone to fit existing housing</li> </ul>	<ul style="list-style-type: none"> <li>• ~ 10% less electrical power in operating mode at same air velocity</li> <li>• Easier installation and maintenance due to smaller and lighter impeller</li> <li>• ~ 5 dB(A) quieter operation</li> </ul>

## ▶ PROJECT OVERVIEW

The client approached punker with the request for an alternative impeller, which fits their existing housing and performs equally or better than the existing impeller. punker designed a solution based on an efficient and quiet impeller with aluminum airfoil blades and a corresponding inlet cone. Practical field tests in the car wash systems showed that this combination delivers similar air speed with less power consumption and less noise.

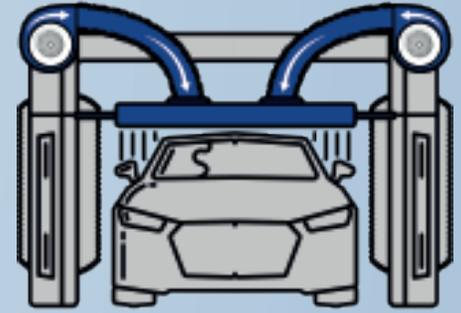
## ▶ OUR CUSTOMER

Our client produces, markets and services a complete range of car wash systems with conventional brushes, cloth washers and high-pressure water jets for cars and commercial vehicles. They sell complete car wash systems (Rollover systems, tunnel systems and self-serve car wash systems) – but also service, chemicals, ancillary products. Their customers include gas stations/convenience stores, retail car wash operators, auto dealers and fleet operators. Each day, equipment manufactured by this group of companies washes over two million vehicles around the world.

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## ▶ CHALLENGE

Our client's attention was drawn to punker through its German parent company, which looks back on many years of cooperation with punker. The global leader of car wash systems' subsidiary in the USA was looking for an alternative impeller for their car-wash-blower, which fits their approved spiral housing installed in many car-wash systems. The housing width was extremely wide, compared to punker's optimal design requirements for installation width (including impeller and inlet cone). Finding a satisfying solution without any losses in air, acoustic and electrical performance was the main challenge.



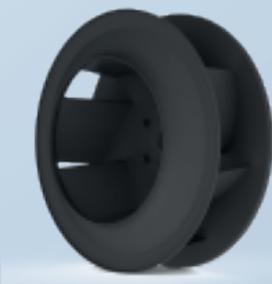
## ▶ SOLUTION

punker tested the overall performance of the customer's existing blower system at their own test facilities by measuring air performance (static pressure vs. air-flow), noise and electrical power. punker elaborated different design options based on their aluminum airfoil impeller. The solutions were discussed with the client's engineers and were validated at the client's test facility regarding installation applicability for new and existing dryer systems.

Advantages and disadvantages were discussed with the customer and the best identified design received a final improvement by the engineer's collaboration between the client and punker to reach the performance optimum. The benefits for the customer are ~10% less electrical power in operation mode, approx. 5 dB reduced noise, and a smaller and lighter impeller which reduces the loads on the motor bearings.

## Xcarwash

- ▶ Diameter range 355 - 450 mm
- ▶ Aluminum impeller, powder-coated
- ▶ Airfoil blade geometry
- ▶ Taperlock-Hub
- ▶ Clockwise / counter-clockwise rotation available



Xcarwash is a **high-efficiency, low-noise fan impeller** that helps carwash manufacturers achieve high airflow speeds in the dryer nozzles and thus **optimal drying results**. At the same time, **power consumption remains low** in the main operating mode.

Made of aluminum, the impeller requires less starting current than industry-standard steel impellers due to its low weight. Thanks to the powder coating, Xcarwash can also be used in corrosive environments.

The combination of airfoil blade geometry and optimized inlet nozzle ensures **low noise emission**. Thanks to the reduced depth of the inlet cone, particularly **space-saving housing designs** can be realized. Xcarwash has been tested on the cycle test bench to simulate applications with a high number of start-stops, as is common in carwash systems