



## Use Case of High-Speed Fan Systems

### Brake & Tire Cooling

Automotive racing, especially high-performance vehicles, are exposed to elevated thermal brake temperatures due to hard braking throughout the duration of a race. The goal of every great brake systems is the same: to decrease the operating temperature of the braking system. Brakes generate massive amounts of heat and is the only system in the car producing heat that exceeds 1,000 degrees F outside the combustion chamber of your engine.

Brake components have a window of temperature which they can optimally operate within. Performance is altered greatly when they exceed their maximum operating temperature ratings. The list of problems that arise as the brakes see higher temperatures are:

- Calipers will exert uneven pressure on the brake pads and will begin to warp
- Brake fluid will reach boiling temperatures
- Glazed brake pads that will degrade grip on the rotor
- Cracks on the rotor that will cause failures

Cooling the brakes is essential to achieving maximum performance of your braking system. Traditional brake cooling systems use NACA ducts that route air from an inlet duct on a vehicle in which a hose would route to a specific location. While this helps the issue, it does not solve the primary problem of cooling your braking system when you need it most.

Tire temperature management also plays a critical role in automotive racing. This has been a longstanding understanding with race teams that keeping your tires at an optimal temperature will allow you to grip better, achieve longer stints and enhance performance. This is also traditionally managed by NACA ducts that route air to the tire directly.

## The solution

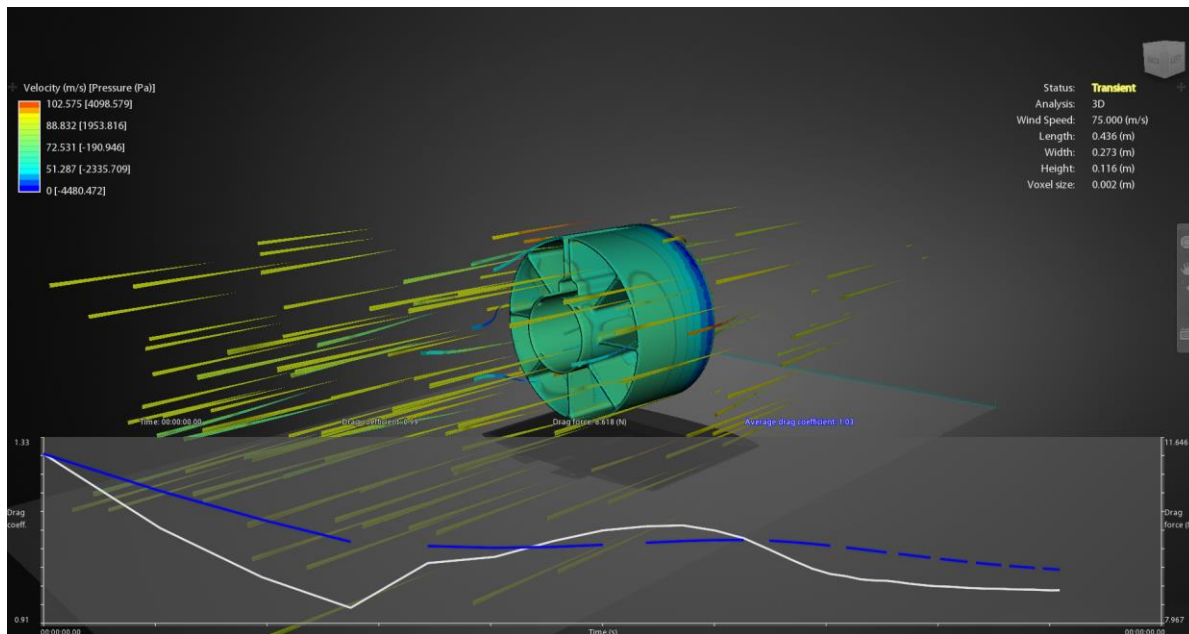
Steele Racing Product's forced induction cooling system is the only system that allows you to effectively and efficiently manage your brakes and tires and is truly built for racing applications. With over 20 years of aerodynamic engineering experience, our fans have been tested and proven with numerous top NASCAR, IMSA and the European racing teams all over the world.

Engineered to withstand the toughest racing environments, our fans are CNC machined out of 6061 and 7075 grade aluminum and using 5 axis manufacturing for the ultimate aerodynamic precision in airflow. Not only is our fan mechanically robust and reliable but our internal electronics and motors are as well.

Steele's brushless speed control system allows you to either have the option of remote mounting the controller or have it internally integrated in the fan for better packaging. We specify only the best hardware components to ensure maximum performance and reliability.

Our fans are adjustable using software by connecting the fan to a computer via USB cord, ranging from 0 to 25 amps at maximum speed. When disconnected from a computer, the fan operates at a single speed from which the last setting was saved as.

## Tested and engineered for excellence:



By understanding the aerodynamic capability of our fans, we are able to offer the opportunity to alter the aerodynamics of a car. (i.e stalling or reversing airflow through a NACA duct) of where the fan is mounted. In most recent applications, we've achieved over 40 ft/lbs. of downforce with top NASCAR teams by leveraging the high-speed capability of our fan. Because every car is different, we encourage teams to thoroughly test different areas of their car with our fans to expose the aerodynamic advantage that is being untapped.

**Benchmark testing with Pi data systems, Pitot tube and digital pressure transducer:**



**Tire cooling area example:**



### Brake cooling area example:



### Conclusion

Decreasing the temperatures of the brakes can dramatically increase their lifespan. Tire cooling management will also yield performance gains as well. In many cases, brake pads can nearly double in its remaining-useful-life and effectively paying for itself over time. We have had many years of success in helping top race teams around the world with their brakes, tires and aerodynamic needs with our fan systems and have helped win championships. Forced induction fan systems are the future of competitive racing and we aim to serve every enthusiast and professional around the world with our solutions.