

Promoting the Business of Motorsports in North Carolina

# NC motorsports

## industry news

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## FEATURE STORY

# KEEPING COOL

## NEW PRODUCT COOLS DOWN OVERHEATED DRIVERS

**R**ich Shafer spent countless hours in hospital operating rooms over 20 years selling implants to orthopedic surgeons. In the mid-1980s, surgeons were affected by the AIDS scare because it was discovered that if you cut into bone during surgery, the virus would aerosolize, increasing the risk of infection of those nearby.

The first answer was to put doctors into airtight suits, but that caused overheating during long surgeries. But if you cool the operating room to save the doctors, the lower temperatures weren't good for the patients.

"I thought, 'Why don't we cool the doctors?'" Shafer said.

**So, he set to work developing a vest that would cool the skin by circulating cold water through tubing sewn to the cloth. In 1994, the first vest appeared in an operating room and Shafer has been a crusader ever since.**

Naturally, his focus turned to racing because of the type of clothing required for a driver, the extreme heat in a race car and the length of time spent inside the car.

"I've been a racer for 20 years," said Shafer. "Mostly SCCA time trials and hill climbs. But you can sit in the staging area for 30 minutes before you start the time trials and a GT-1 car can get pretty warm. I thought that we could put the tubing in a T-Shirt."

Shafer is now president of Cool Shirt, a company that makes personal cooling systems for surgeons, race car drivers, football players & other athletes, and industry. He preaches the gospel of the effects of body temperature on performance and why it's vitally important to keep the body cool, especially when it is under extreme duress, which is the case in long auto races.

"NASA conducted a study that said when the temperature is 95 degrees for an extended period, people can make 60 mistakes per hour," Shafer said. "And they don't even realize it. When you perspire, half of your blood moves to the skin to produce moisture in the form of perspiration to naturally cool the body. That means the rest of your organs, including the brain and your muscles, are only operating on half the blood they normally get.

"What does that mean when you are driving a race car? It affects the driver's fatigue and their decision-making, which is critical when you are going that fast. We're trying to make racing safer."

There are four ways to lose body heat when the temperature runs too high. Radiation occurs when the outside temperature becomes lower than the body temperature. Convection is heat loss through air and water vapor that must be a lower temperature than the skin. Conduction transfers heat from warmer to cooler by contact. And evaporation is the release of perspiration through the sweat glands to the skin's surface.

When the temperature gets above 95 degrees, radiation, convection and conduction don't work and perspiration is all you have left. When half the body's blood moves to the skin to produce perspiration, fatigue and poor decision-making become the greatest dangers to the body. **"The beginning of heat exhaustion occurs when you lose 2 percent of your body weight through perspiration. We cool the blood with the Cool Shirt."**

Shafer's most popular product is the Club 12 System, which runs 12 quarts of cool water through 50 feet of medical

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grade capillary tubing stitched to the front and back and has four cooling zones. The system features an internal pump in a unit that contains ice and water and gets to the shirt through an eight-foot hose.

The shirt covers 30-40 percent of a driver's body and is designed to cool the blood next to the skin so that the normal blood flow reaches the organs that need it most under duress. The system can keep a driver cool for up to four hours.

"Every one of our systems is temperature controlled so that the driver doesn't get too cold," Shafer said. The controller hose is available to be operated manually or with an electronic switch. The weight of the entire system is only four pounds.

Shafer has been the most successful thus far with road racers, with more than 10,000 systems in place in that area of motorsports. "Road racers get hotter than drivers on circle tracks," Shafer said. "While I'd hate to drive a NASCAR Cup car that fast with that many cars nearby, the road racers are exercising much more. When NASCAR goes to road course tracks, some of the drivers are using our product."

Leighton Reese is a Grand Am Pro road racer from Minneapolis who has been using the Cool Shirt since trying one of the prototypes in the late 1990s. He is currently driving the GM-factory cars in the Rolex series and recently won the Rolex Grand AM Race at Limerock.

"Road Races can last anywhere from 2 1/2 hours to 24 hours," Reese said. "We have multiple driver changes and the Cool Shirt keeps our core temperature down. When it's hot and humid, the inside of the car is like a furnace. The Cool Shirt keeps the body temperature in the normal range and lets our brains function."

**"Road racing is very physical. We are holding onto the steering wheel with one hand and shifting with the other, while dancing on the pedals with both feet. We don't get to hang onto the wheel with both hands. But for endurance racing, we really like the Cool Shirt."** 🏁🏁



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