



# TAKING TESTING TO THE TRACK

## DOW AND RICHARD CHILDRESS RACING TEST PROTOTYPE TECHNOLOGIES THAT SPEED IMPLEMENTATION IN AUTOMOTIVE APPLICATIONS

As the primary sponsor of the No. 3 Dow Chevrolet, driven by Richard Childress Racing (“RCR”) Cup Series driver Austin Dillon and owned by Richard Childress, Dow and RCR scientists and technicians are pushing automotive performance to the limits.

Dow and RCR’s partnership has enabled scientists and engineers to test automotive systems and technologies in one of the most extreme operating environments—the racetrack—to ensure they deliver. The benefit of this extends beyond the partnership to the automotive industry as a whole – with the ability to accelerate widespread technology and system adoption, auto manufacturers can meet evolving consumer and regulatory demands for passenger vehicles.

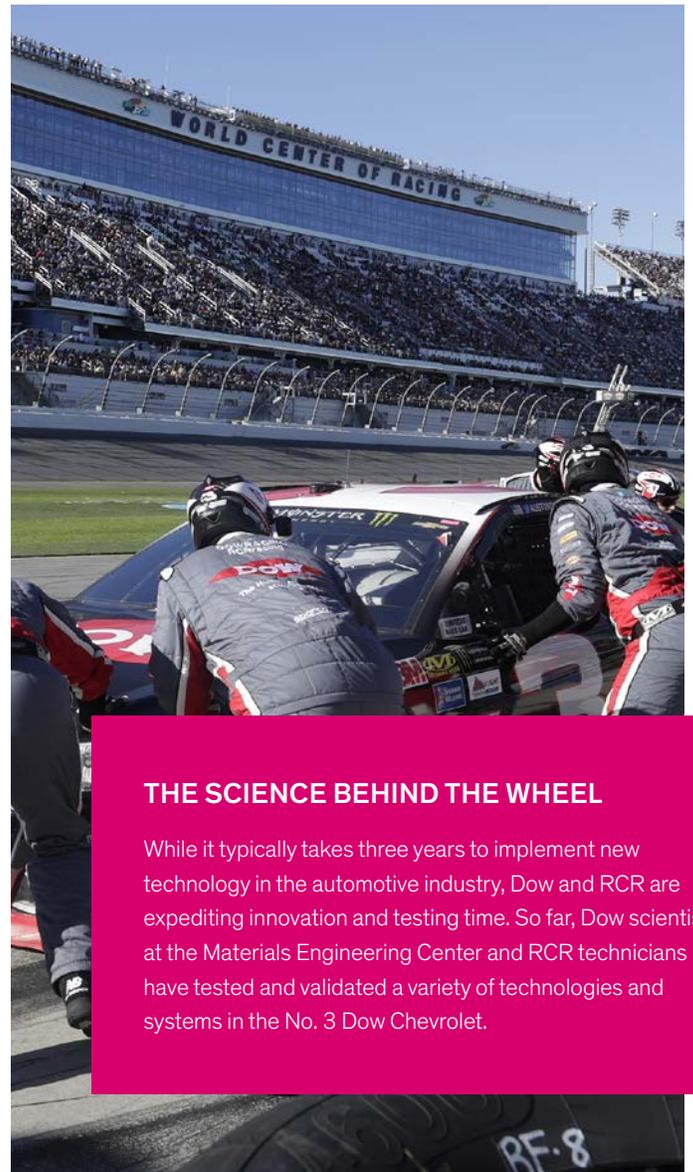
### SEALING IN A WIN

Using the right sealant can make the difference between a winning and failing engine. Sealing engine mating surfaces can be a challenge without the right sealant. Improper sealing can cause surfaces to shift, triggering engine leaks, damage and failure.

When RCR needed a new sealant for engine component interfaces, the technician team compared Dow sealants to a variety of other sealants in a quantitative and qualitative evaluation to determine:

- Ease of application
- Cure time and direction
- Chemical resistance to engine fluids
- Ease of removal

After a thorough evaluation, the team selected Dow Corning 3-0205 sealant from Dow Performance Silicones as the preferred product for this application. The Dow sealant is being used in Austin Dillon’s No. 3 Dow Chevrolet during competition, successfully demonstrating the exceptional sealing performance for other automotive applications.



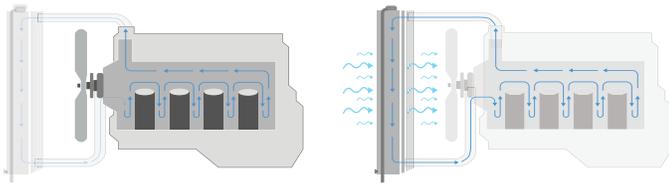
### THE SCIENCE BEHIND THE WHEEL

While it typically takes three years to implement new technology in the automotive industry, Dow and RCR are expediting innovation and testing time. So far, Dow scientists at the Materials Engineering Center and RCR technicians have tested and validated a variety of technologies and systems in the No. 3 Dow Chevrolet.



## THE CARBON FIBER COOL FACTOR

A car's cooling system keeps the engine from overheating. Located in the engine compartment, the radiator fan cools the coolant by pulling air across the surface area of the radiator to increase cooling.



A radiator fan shroud acts as a guard for the fan and helps direct the flow of air to maximize cooling effect.

To resolve fan shroud failures experienced under the high temperatures of racing conditions, Dow scientists and RCR technicians developed a carbon fiber composite prototype shroud that could withstand high temperatures (up to 400° F) and weigh the same as or less than the existing shroud equipment. The new shroud provides an opportunity for the teams to learn more about processing and product development using a carbon fiber composite material. The team is currently developing a shroud as a long-term solution.

Carbon fiber composite is being used more frequently because it is lightweight, durable, provides thermal performance and offers additional protection from fan shroud failures.

## GREASING THE GEARS

Lubricants can be considered the blood of a car engine and proper lubrication can mean the difference between a smooth engine purr and engine seizure or component damage. Essential for all moving parts of a car, lubricants:

- Help decrease the power needed to overcome friction
- Reduce the wear between the bearing surface to increase power output and engine service life

When RCR sought to improve the performance of several engine applications including rod bearings, O-rings, fastener threads and shaft sealants, the technicians implemented solutions from Dow Performance Silicones that help reduce losses to friction in moving parts and improve the assembly and disassembly of components.

- Dow's Molykote® 111 Lubricant for O-Ring assembly improves the holding strength with the least mess at elevated temperatures.
- Dow's G-9000 high temperature silicone grease helps prevent oil leakage at high temperatures.

## USING THE RACETRACK AS THE LAB

When Dow and RCR engineers collaborate, they are able to test and learn more about how automotive technologies perform both in racecars on the track and passenger vehicles on the road. And the innovation doesn't stop there. Looking forward, Dow and RCR plan to collaborate on opportunities ranging from thermal management to enhanced engine lubricants.

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