

# Corvettes Race Renewable Fuel

By Todd Kaho

For many [car](#) enthusiasts, the Chevrolet Corvette is the ultimate performance car. So why not make that performance *green*? It's a good question and one that General Motors and Corvette Racing have answered with the bright yellow C6.R Corvettes competing in the American Le Mans Series. The cars burn E85R (R is for Race), a mixture of 85 percent renewable high-octane ethanol and 15 percent racing gasoline. The ethyl alcohol is cellulosic ethanol made from wood waste, not food feedstocks.

The American Le Mans Series is in full support of the Corvette Racing effort. This past January, the American Le Mans Series partnered with the Environmental Protection Agency, U.S. Department of Energy, and SAE International to announce Green Racing Initiatives in Detroit. The Green Racing Challenge encourages manufacturers to introduce green technologies in their race programs.



While the Corvette Racing team was working on the use of E85R, the American Le Mans Series was following a path to more sustainable racing. Doug Fehan, Corvette Racing program manager explains: “The American Le Mans Series has positioned itself as a leader in this area and they were in pursuit of a similar thing. They called and asked if I would be interested ... the timing was incredible, there was this confluence of thought. I jumped at the opportunity, took it to my bosses, and they thought it was a wonderful idea.”



General Motors has a considerable investment in FlexFuel vehicles with 3 million cars and [trucks](#) on the road. It is also working with ethanol producers to develop less expensive cellulosic E85 ethanol supplies. GM is currently building about 400,000 E85 capable vehicles per year and plans to double production by 2010. E85 capability will also be expanded to a broader range of vehicles so that half of GM's models will offer FlexFuel operation by 2012.

“There is no one here who thinks that ethanol is *the* answer,” says Fehan. “Ethanol is part of the overall solution. Cellulosic ethanol doesn't take food out of the food chain. It's the stuff off the forest floor ... it can be orange rinds, essentially garbage.” Another environmentally friendly aspect of the E85R program is that the ethanol used in the Corvette Racing ALMS cars is made from wood waste and forest debris collected as part of the South Dakota Black Hills National Forest wildfire prevention program.

The conversion to cellulosic ethanol is handled by KL Process Design Group at a pilot plant in Upton, Wyoming. Lignin, a co-product of the cellulosic conversion product, is burned in a self-sufficient conversion powerplant that also feeds excess electricity back to the grid. The lignin is additionally used to make a wide range of products including composite woods, livestock bedding, cosmetics, and paints.



Chevrolet's C6.R racecar competes in the GT-1 (formerly GTS) production-based class of the American Le Mans Series. These cars' 7.0-liter small block V-8 engines produce nearly 600 horsepower. The team has found virtually no difference in performance between E85R and standard race gas. The high octane ethanol, however, produces a little less energy by volume than gasoline. Accordingly, fuel mileage is lower and this requires a slightly larger fuel cell (racing fuel tank) to achieve

the same range between pit stops. In addition to minor modifications to the fuel system to accommodate the drying properties of ethanol and changes to the adhesives used in the fuel cells, the only major modification is recalibrating the fuel curves with a laptop computer. While a bit more fuel is provided the combustion chambers to achieve the same horsepower as gasoline, the ethanol actually burns slightly cooler so heat is not an issue.

The Corvette is a remarkably efficient performance car in stock trim. With an LS6 6.2 liter V-8 and six-speed manual transmission, a new Vette delivers 16 mpg city and 26 mpg on the highway. Compare that to a new Honda Accord with a 3.5 V-6 and six-speed manual at 17 mpg city and 25 mpg highway. Certainly, with 430 horsepower and 424 lbs-ft of torque, the LS6 isn't working very hard to move the Corvette down the road and with proper gearing can sip fuel with the best of them.

Most impressive is the fact that the switch from racing gasoline to E85R has been completely uneventful, without the teething pains one might expect with a change of this magnitude in a major race program. Corvette Racing continues its winning ways, too, by its domination of the GTI-1 class with an impressive string of victories. Over the past 55 years, Corvette has been a technology leader for General Motors, making Corvette Racing's switch to renewable fuel all the more appropriate. It must be a good idea, since [auto](#) icon and NBC Tonight Show host Jay Leno has a personal 600 horsepower E85 fueled Corvette in his stable as well.