

## *Antifreeze basics*

It really used to be much simpler than it is now. When you needed some antifreeze, you just went to the parts store and got some -- all cars used the same old green or yellow/gold stuff. Today, it's not that simple any more. There's now red, orange, green, yellow and blue to choose from and they're not all compatible with each other. Still, the majority of the cars on the road use the good old green or yellow/gold antifreeze. To find out for sure which one your car has, look in the owner's manual, or better yet, open the radiator cap and see what you've got. Before we look at the various types of antifreezes, let's take a look why your car's engine needs antifreeze at all.

Actually, if you just added some anticorrosion additives to water, you'd have all an engine needs. This combination has limitations, namely that it'll freeze and it can boil over. By adding some ethylene glycol, a type of alcohol, to the water/anticorrosion additive mixture, the freezing point of the mixture is lowered and the boiling point is raised. What's wrong with just using pure ethylene glycol? The interesting thing about pure ethylene glycol (we'll just call it antifreeze from here on) is that it'll freeze at about the same temperature as water. When combined with water at greater concentrations than the normal 50-60 percent, it won't carry the same amount of heat from the engine to the radiator as pure water. So the thing to do is to just stay with the accepted 50-60 percent ratio of antifreeze to water.

Another interesting thing about antifreeze is that it never gets used up. Then why do we need to change it every few years? What goes away are the rust and corrosion inhibitors which are necessary, otherwise the engine's water pump and radiator will quickly corrode. The most common inhibitors are called silicates and they are used to protect the aluminum and other parts of the engine's cooling system.

Within the past few years, new types of corrosion inhibitors have been developed and they are called organic acids. Cars made by General Motors, the Mercury Cougar and VW/Audi cars use antifreeze that contains organic acids. To differentiate it from the traditional antifreeze, it is colored either red or orange and it is supposed to last 150,000 miles or five years. (By the way, it's pink in Audis). That is longer than the traditional antifreeze. Havoline Dex-Cool and Prestone Extended Life are two brands that contain the new organic acids. Keep in mind that you're not supposed to mix the new red/orange antifreeze with the old green, yellow/gold type.

Just to confuse things a bit more, 1998-99 Chrysler LH cars (Intrepid/Concorde/300M) use a different type of orange antifreeze, which is a mixture of silicates and organic acids. It isn't compatible with the other red or orange antifreezes and you can only get more of it from your friendly Chrysler/Dodge dealer.

There's more. The green antifreeze used in most Japanese cars does not contain silicates and it's not the same as the old style green, yellow/gold antifreeze. The yellow that is used in some European cars is different from our yellow, even though it contains silicates.

And let's not forget the red used in Toyota cars and the blue that is used on some European and Korean cars.

The question that most people would probably ask is, "What do I do in an emergency?" If all you have is the older green, yellow/gold antifreeze, use it, because it's better than overheating or freezing. However, it's best to use whatever antifreeze your car came with originally.

Can you use the newer red/orange antifreeze (the one GM cars come with) on other cars? You're not supposed to because the red/orange antifreeze is specifically designed to be used on cars that have aluminum radiators instead of radiators made from copper and brass. The red/orange antifreeze will not provide the protection needed for the lead solder used in copper and brass radiators. So what it comes down to is, if your car has an aluminum radiator, stick with the red or orange antifreeze.

As for all the other colors (except the special Chrysler orange), you can use the traditional green, yellow/gold antifreeze in your car. With the antifreezes that have silicates -- the Japanese green, the Toyota red, and the European yellow and blues -- you can use the traditional green, yellow/gold. You may be compromising the longevity of some of the original equipment antifreeze, though. As for the Japanese red or green that doesn't have silicates, you can use the common green, yellow/gold antifreeze but it's best to do so after the system has been flushed out and thoroughly rinsed.

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