Antifreeze FAQ

What is Antifreeze?

Merriam-Webster Online defines antifreeze as follows:

Main Entry: an·ti·freeze
Pronunciation: 'an-ti-"frEz
Function: *noun*
: a substance added to a liquid (as the water in an automobile engine) to lower its freezing point

Almost all forms of coolants and heat transfer fluids rely on a glycol antifreeze to lower the freezing point of the solution. Common nomenclature calls the resulting solution antifreeze as well. Technically, though, it is more appropriate to call these solutions engine coolants or heat transfer fluids. There are two varieties of glycol: ethylene glycol and propylene glycol. Both can be used in automotive or heavy-duty engine coolants or glycol-based heat transfer fluids. Modern engines use a mixture of glycol and water for coolant, with corrosion inhibitor chemicals and dyes included with the glycol.

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How does antifreeze differ from engine coolant?

Engine coolant is a generic term used to describe fluids that remove heat from an engine. Antifreeze is a more specific term used to describe products used to provide protection against freezing. Many people use these terms interchangeably, as we also do in this FAQ.

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I know that antifreeze prevents my engine's cooling system from freezing in the winter, what else does antifreeze do for my engine's cooling system?

Antifreeze (engine coolant) performs several functions in addition to providing freeze protection. Antifreeze contains chemicals that inhibit corrosion and scale formation in the engine and radiator. Antifreeze (engine coolant) provides protection against boiling in the summer. At one atmosphere pressure pure water boils at 212 °F (100 °C) but a 50/50 blend of water/ethylene glycol boils at 223 °F (106 °C).

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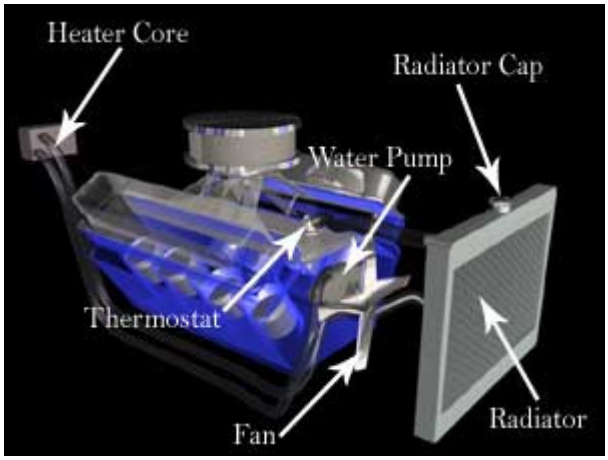
How does the cooling system work?

The cooling system consists of a radiator, water pump, hoses, fan(s), heater, thermostat and engine coolant. The cooling system removes excess heat from the engine block and heads, keeps the engine operating at its most efficient temperature, and gets the engine up to the correct temperature as soon as possible after starting. Ideally, the cooling system keeps the engine running at its most efficient temperature no matter what the operating conditions are.

Environmental issues require cleaner burning engines. Engine manufacturers have raised engine operating temperatures in order to reduce exhaust emissions and improve fuel economy. Today's engines run on the borderline of overheating, with in-cylinder combustion temperatures around 2,000 °F.

As fuel is burned in the engine, about one-third of the energy in the fuel is converted to kinetic energy for moving the vehicle. Another third goes out the exhaust pipe and the remaining third is removed by the cooling system. If no cooling were provided, metal parts would melt and the pistons would seize. The engine coolant must have indirect contact with the combustion chamber, the cylinder walls, and the valve seats and guides. As the engine coolant circulates through the engine, it picks up heat from the engine. The coolant releases this heat as it passes through the radiator.



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How much new antifreeze is produced each year?

Worldwide, over 400 million gallons of antifreeze concentrate are sold each year. After the typical 50% dilution with water, this yields about 800 million gallons of engine coolant. Between 25 and 50% of this volume ends up improperly in the environment, and dumping by consumers is a major cause of this pollution. Approximately 90+% of the remainder is mixed with wastewater, treated, then discarded to surface waters.

Since ethylene glycol is a petrochemical product, its price rises along with natural gas and crude oil prices. Governments are imposing more regulations concerning antifreeze management. Consumers are expecting more regarding responsible resource stewardship. These factors mean more antifreeze will be collected for beneficial reuse/recycling. Proper cooling system maintenance and good recycling practices can mitigate the harmful effects of antifreeze on our environment.

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What is the difference between ethylene glycol and propylene glycol?

Ethylene glycol and propylene glycol are chemically similar. Ethylene glycol has the chemical formula C2H6O2. Propylene has the chemical formula C3H8O2. Ethylene glycol has a slightly higher boiling point than propylene glycol. Ethylene glycol is less expensive to produce and is more widely used. Propylene glycol is less toxic.

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I have seen propylene glycol based antifreeze sold as an environmentally friendly alternative to ethylene glycol based antifreeze. Is this true?

Both propylene glycol and ethylene glycol have similar biodegradability and will eventually break down into nontoxic byproducts. Neither should be dumped in the environment. Antifreeze picks up heavy metals such as lead during use in the engine. Therefore, both ethylene glycol and propylene glycol antifreezes should be returned to a recycling center to minimize harmful effects on our environment after use. Spills should be cleaned up immediately.

Ethylene glycol is more toxic than propylene glycol. Ingesting a small amount of ethylene glycol is far more dangerous for small children or animals, for example, than ingesting a small amount of propylene glycol. Take appropriate steps to prevent the ingestion of either ethylene or propylene glycol, as well as new or used engine coolants containing these glycols.

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Can I add propylene glycol based antifreeze to my existing ethylene glycol based antifreeze?

Ethylene glycol and propylene glycol are chemically very similar and can be mixed without harming the cooling system. Ethylene glycol does have better heat transfer properties than propylene glycol. Adding propylene glycol does not make the ethylene glycol less toxic.

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Most people I know never bother with their antifreeze maintenance, yet they change their oil regularly. Because most engine coolants last so long, is it OK to neglect the antifreeze?

No, it is never OK to neglect cooling system maintenance. Scale buildup and corrosion in radiators, for example, can cause overheating problems or radiator failure. Changing your antifreeze regularly will keep your engine running smoothly and help prevent breakdowns. The American Automobile Association attributes the most common cause of vehicle roadside breakdowns to cooling system failures.

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How often do I need to change my antifreeze?

You should always follow the vehicle or engine manufacturer's recommendations for antifreeze change intervals and cooling system maintenance.

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Is used antifreeze poisonous?

Yes. New antifreeze and used antifreeze has a sweet taste that small children and animals can find attractive. If ingested, antifreeze affects the central nervous system and can cause death. A couple of states in the US require the addition of a bittering agent to make antifreeze less tasty to children and animals. Every year about 10,000 cats and dogs are victims of accidental poisoning by ingestion of antifreeze.

The symptoms of antifreeze poisoning include vomiting, weakness, and loss of coordination. Contact your local poison control center for first aid information.

Most antifreeze contains ethylene glycol, which is poisonous to both humans and animals when ingested in small amounts.

Some types of antifreeze use less toxic propylene glycol, but it can still cause harm if swallowed.

Always keep antifreeze securely stored to protect yourself and others. Toxic materials such as lead and benzene might be found in automotive cooling systems. These can also be present in used antifreeze.

For more information:

American Association of Poison Control Centers

Animal Poison Control Center

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Does used antifreeze endanger the environment?

Yes, pure ethylene glycol is toxic to aquatic and land based life forms. Fortunately, it will eventually break down into water and carbon dioxide.

However, used antifreeze contains more than just ethylene/propylene glycols and water. Contaminants found in used antifreeze, such as lead and benzene, can cause serious health and environmental problems. Antifreeze manufacturers also add a variety of chemicals to antifreeze to inhibit rust and corrosion. These chemicals can endanger the environment. Large quantities of glycol can suffocate aquatic life and disrupt sewage treatment processes.

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What should I do with used antifreeze that I remove from my radiator? Can I just pour it down the drain or the sewer in the street?

Never pour used antifreeze down the drain or in the street. Both ethylene glycol and propylene glycol are toxic. Used antifreeze also picks up heavy metals like lead during use in the engine. These should not be released to the environment. Properly dispose of used antifreeze at an appropriate collection center.

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How can I protect the environment and myself from used antifreeze?

EET encourages the proper handling and recycling of used antifreeze by offering **best management practices** to aid both consumers and businesses.

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Is it true that cooling system problems are the leading cause of engine failures? Can using the right antifreeze help?

Yes, cooling system neglect is the leading cause of premature engine failure. Using the right antifreeze is only part of the solution. Poor water quality and incorrect dilution are root causes for most cooling system problems.

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How much water should I mix with my antifreeze?

If you mix antifreeze with distilled water at the ratio of one part antifreeze to one part water, you will have freeze protection down to –34°F and boil-over

protection up to 265°F (if using 15 PSI pressure cap). Never use concentrated antifreeze in a cooling system without adding water. At least 40% of the mixture should be water.

Refer to **freezing points of aqueous glycol solutions** for the proper concentration levels of ethylene and propylene glycol.

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If I buy concentrated antifreeze, can I get the proper water/glycol mixture using tap water?

Using “hard” water out of the tap can cause scaling in the engine. Tap water is purified for drinking by chlorination, which kills germs but can cause corrosion in the engine. Even if you carefully measure the amounts of tap water and antifreeze to get the right blend, using tap water is not a good idea. Tap water also contains dissolved oxygen, calcium, magnesium, and other contaminates besides chlorine and chlorides that can significantly degrade corrosion inhibitor performance.

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If I buy concentrated antifreeze, how can I insure I get the proper water/glycol mixture for my climatic conditions? Do I need to mix it before I pour it in the radiator?

You cannot tell whether or not you have the proper water/glycol mixture just by looking at the antifreeze. A hydrometer uses floats to measure the specific gravity of the glycol/water mixture and indicate the amount of glycol. A refractometer measures the bending of light by the glycol/water mixture to determine the amount of glycol. Refractometers generally are more accurate than hydrometers. Measuring and mixing the water and antifreeze before adding them to the radiator is good practice. Mixing errors and the harmful effects of using tap water can be eliminated by using a pre-mixed antifreeze formulation like Arctic Blend™. The water used in Arctic Blend™ antifreeze is de-ionized and won’t contribute to corrosion or scaling in cooling systems.

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I live in Florida, what should the percent glycol be in the antifreeze I use? I will make an occasional trip to Cincinnati in the winter.

Antifreeze products do more than just provide freeze protection. They also contain corrosion inhibitors that protect the engine and radiator. Maintain antifreeze concentration at least a 50/50 mix of glycol/water to ensure proper corrosion protection regardless of where the vehicle is operated. A 60/40 glycol/water mix is preferred for colder climates found in northern US and in Canada.

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What type of water should I use in my radiator?

Water quality is critical. Vehicle manufacturers recommend mixing de-

ionized or distilled water with antifreeze. Do not use tap water, which may contain minerals that will corrode your cooling system and/or cause scale buildup. Do not use water softened with salts. The water used in Arctic Blend™ antifreeze is de-ionized, which is chemically equivalent to distilled water. It has gone through EET's multi-step decontamination and desalting processes and won't contribute to corrosion or scaling in cooling systems.

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How can I tell if I have the right amount of antifreeze (ethylene or propylene glycol) in my engine coolant?

A refractometer is the most accurate way to check the percent of antifreeze in coolant.

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What happens if I use too much antifreeze or water?

Using too much antifreeze or water in your engine coolant can harm your vehicle. Antifreeze concentrations higher than recommended levels can cause problems including corrosion, water pump failure, and increased engine wear. Increasing the concentration of ethylene glycol above 60% actually hurts the engine's freezing and overheating protection. More is not always better!

Adding too much water to the cooling system lowers the concentration of corrosion inhibitor and antifreeze and results in decreased protection against corrosion and freezing.

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Why do most vehicle and antifreeze manufacturers recommend using pre-diluted ready-to-use antifreeze?

Radiators in today's vehicles are extremely fragile and lightweight. They contain smaller cooling tubes and more cooling fins than older models so it is easy to clog the radiators with corrosion products if you do not use the right mixture of antifreeze and water.

More than 37% of motorists jeopardize their vehicle's cooling system by pouring either straight antifreeze or water into their radiator.

Using our premixed Arctic Blend™ recycled antifreeze products eliminates the guesswork of mixing antifreeze yourself.

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EET offers only pre-diluted antifreeze. Is using pre-diluted antifreeze better than using concentrated antifreeze and adding water to suit?

Yes, using pre-diluted antifreeze has a number of advantages. Pre-diluted antifreeze ensures maintaining the proper 50/50 blend of antifreeze and water. EET uses deionized water in its pre-diluted Arctic Blend™ antifreeze

formulas. The deionizing process removes minerals and other chemicals that can cause scaling and corrosion in engines.

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Why should I buy premix antifreeze? I'm just paying for high priced water!!

Engine manufacturers recommend using 50% water to antifreeze by volume. They also recommend that the water should be pure water, such as deionized or distilled water.

People commonly add tap water (which contains minerals, dissolved oxygen and chlorine) to concentrated antifreeze. These chemicals can quickly use up the corrosion inhibitor additives in the antifreeze. Furthermore, more often than not the final engine coolant (antifreeze/water) mix is not within the recommended range, dramatically shortening engine and cooling system life.

Not all water is created equal. Deionized or distilled water contains fewer undesirable chemicals and minerals, which results in optimum coolant life and performance. Deionized water is recommended for shop blending, but prediluted coolant is the best choice (preferred) because it ensures quality, saves time, and eliminates mixing mistakes.

If you're interested in protecting your vehicle investment, lets examine some facts:

- Antifreeze/engine coolant is the most neglected fluid in the vehicle.
- Cooling system neglect is cited as the principal reason for premature engine and transmission failure.
- Cooling system failure is the most common cause of mechanical breakdown on the road.
- A national survey found that 7 out of 10 vehicles contain rust and scale and two thirds of more than 8,000 cooling system repair jobs were performed on an emergency basis.
- Just 1/16th of an inch of mineral deposits on 1 inch of cast iron reduces heat dissipation by 40%.

A great deal of work and expense goes into the formulation of quality antifreeze/engine coolant. Reputable companies use high quality glycols, deionized or distilled water, and inhibitors that are certified to be low in contaminants (like chlorides) to blend and make premium quality finished products. Unfortunately, these efforts are wasted when consumers use unsuitable tap water to self-blend the antifreeze.

Calcium and Magnesium – The total concentration of these elements is called water hardness. Calcium and magnesium salts form scale on hot heat exchange surfaces. Scale impedes heat transfer and causes localized hot spots that results in engine overheating and component failure.

Chloride and Chlorine – All municipal water supplies contain chloride and chlorine. Chloride is very corrosive to all cooling system metals, especially aluminum. Chlorine forms additional chlorides in the cooling system.

Sulfate – All municipal water also contains sulfate that contributes to general corrosion and scale formation.

Oxygen – Most people don't drink deionized water because they do not like its taste. Deionized water doesn't taste good due to the lack of oxygen and certain minerals. Tap water, however, is full of oxygen and other minerals making it suitable for drinking and aquariums. Oxygen contributes to metal corrosion and depletion of inhibitors. Water with low oxygen is preferred for engine coolant.

Mixing mistakes - Cooling system problems can also be caused by improper dilution of the coolant/antifreeze with water. These problems include:

- Improper ratio of concentrate to water
- Not stirring thoroughly to mix the water and concentrate
- Mixing the concentrate and water in a dirty container
- Pouring the concentrate and water into the radiator without first mixing them

Header scale - Consequence of using tap water

So if you have used tap water in your antifreeze, you are overdue for cooling system maintenance because deposits likely have been building up. Maybe you already have had the radiator rodded out. Unfortunately, the engine block and heads have the same deposits. A quick acid flush (which can attack copper, aluminum, and brass) will NOT remove what took years and tens of thousands of miles to build up. You are far better off to use pre-diluted Arctic Blend™ antifreeze and keep the cooling system clean in the first place.

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Are all antifreezes basically the same except for color?

No, antifreezes differ in more than color. Antifreeze is made using ethylene glycol or propylene glycol. Antifreeze producers use a number of different corrosion inhibitor packages (with descriptions such as heavy duty conventional with SCA, low silicate conventional without SCA, OAT, and hybrid OAT). Antifreezes can be the same color but use different inhibitor packages. Each unique antifreeze chemistry formulation performs differently. Arctic Blend™ recycled antifreeze is blended exclusively with Fleetguard® corrosion inhibitor technology, and is formulated to meet or exceed all national and international testing standards for antifreeze. The vast majority of recycled antifreeze in the USA does not meet these standards.

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Can I top off my radiator filled with green antifreeze with antifreeze of a different color?

Color does not necessarily indicate what kind of corrosion inhibitor is contained in antifreeze. You have to read the label. Mixing different types of antifreezes can reduce their corrosion protection and can actually lead to corrosion problems. Engine manufacturers recommend a 10% limit on mixing coolant types. If you need to add more than 10%, it is recommended that you flush your radiator system and replace the antifreeze.

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What do all the different colors of antifreeze mean and what should I be using?

In the past, most antifreezes were green. Now, manufacturers use a variety of colors in their antifreeze product lines. Green generally, but not necessarily, indicates an automotive or light duty formulation. Orange antifreeze generally means extended-life type of antifreeze. It is ethylene glycol-based like most green antifreezes but contains different corrosion inhibitors.

The various manufacturers use colors to identify their products in a bit of marketing gamesmanship; however, there are no hard rules governing the use of these colors. Equipment manufacturers and consumers should have an ability to identify their approved fluid. In addition, color has been used in antifreezes as a safety measure to discourage accidental ingestion.

Since the mid-1990's, the proliferation of coolant colors has caused considerable confusion. All engine coolants use a glycol base but include different performance additives that inhibit (control) scale/ corrosion. Believe it or not, all of these coolants are clear, water white before dye is added.

The traditional green coolant is based on inorganic additives and is called inorganic additive technology (IAT). It is a tried and proven chemistry that provides a fast acting protective film. The additives deplete, though, and need to be replenished every couple of years.

Fully formulated engine coolants were developed in response to user demands for a simpler, universal, longer life coolant technology. Heavy-duty operators had to use low silicate automotive coolant formulations (high silicate automotive antifreezes could cause "green goo" in diesel engines) that required a separate SCA additive. This often resulted in mixing errors when the SCA was added at initial fill or when topping-off. Unlike automotive antifreeze, fully formulated coolants are pre-charged with SCA's and contain all of the ingredients necessary to protect diesel, gasoline, and gaseous fuel engines. Pink has become recognized as the color for fully formulated coolant, although they are also commercially available in green (as required by government agencies). These products meet performance requirements for major automotive specifications, allowing mixed-fleet operators to stock one antifreeze formula for all of their vehicles.

A new type of antifreeze, referred to as extended or long life, has emerged. Its unique chemistry differs significantly from that used in traditional

antifreezes. Referred to as organic acid technology (OAT), this new chemistry uses organic acids to protect cooling system metals. Extended life antifreezes have been colored red or orange depending on the supplier; however, more colors may be used in the future. While these fluids do not deplete during service, they also do not protect as quickly as IAT coolants. These differences require a significant change in procedures used to maintain the cooling system.

General Motors® has been using this technology (DEX-COOL®) in their cars and trucks since 1996. They use an orange dye for DEX-COOL® product. A Ford Motor Company® study concluded that OAT coolants "do not offer any significant advantages for the consumer…" and "…current coolant corrosion protection can be extended far beyond previous expectations". Cummins Engine Company announced in a memo dated July 16,1999, that OAT coolants are not compatible with their engines. Cummins is reporting that these long life antifreezes cause degradation of silicone seals in their engines after 80,000 to 100,000 miles of service. Cummins, therefore, is not recommending the use of OAT coolants in their engines.

Hybrid organic acid technology (HOAT) uses both inorganic and organic acid additives for long life protection. The objective with HOAT is to provide excellent all around protection and extended drain intervals. HOAT coolants generally can replace or are compatible with green IAT in older vehicles. Chrysler used conventional green IAT coolant until 2001, when they adopted G-05®, a hybrid coolant. Ford followed suit in 2002, dropping the green IAT for G-05® factory fill and extending the drain interval. Variations of HOAT coolants have been around for more than 50 years.

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What is long or extended life antifreeze?

"Long life" or "extended life" antifreeze generally means antifreezes that contain organic acid inhibitors (OAT). Partial organic acid or "Hybrid" technology was developed due to seal and system component incompatibility with early OAT products. These products are available from several manufacturers under various brand names, but in general all carry the long/extended service life description.

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I have heard of OAT antifreeze. Is that made from grain?

OAT stands for Organic Acid Technology. OAT antifreeze is not made from grain. Some organic acids can be used as corrosion inhibitors instead of the traditional inorganic inhibitors, like nitrites and silicates. OAT antifreeze should only be used in newer vehicles designed for its use. Organic acids actually attack the lead solder used in the radiators of older model vehicles.

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What are the disadvantages of OAT antifreeze?

Higher cost, possible incompatibility with other antifreeze types and older

cooling systems, and limited availability.

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What is a "hybrid" technology as related to antifreeze?

"Hybrid" antifreezes contain inorganic and organic corrosion inhibitors. Inorganic inhibitors like nitrite and silicate were used for years in antifreeze. They provide excellent corrosion protection but deplete rapidly. The past ten years have seen the introduction of OAT antifreezes that rely on organic acids for corrosion protection with extended life. Hybrid antifreezes combine inorganic inhibitors with organic acids to get the best features of both.

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What is the difference between "light duty" antifreeze and "heavy duty" antifreeze?

"Light duty" antifreeze is intended primarily for gasoline-engine passenger car applications. "Heavy duty" antifreeze is intended for diesel engines in both on- and off-highway applications. Diesel engines in heavy-duty truck and construction equipment have more severe corrosion prevention requirements than gasoline-engines in passenger cars and therefore require more corrosion inhibitors. Using "light duty" antifreeze in an over-the-road tractor will cause cooling system problems unless an SCA in proper amount is added to the antifreeze.

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What coolants can be mixed?

Although extended life antifreeze is compatible with traditional formulas, it is recommended by extended life antifreeze manufacturers and suppliers that the two types not be mixed. Mixing the two types negates any extended life characteristics.

See
Reference chart

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I am a mechanic and am bewildered with the variety of antifreezes on the market. Is there a reference chart that summarizes what antifreeze is right for the vehicles we see in the USA?

Yes, EET has developed a table that can guide the mechanic or do-it-yourselfer with antifreeze compatibility questions, see Reference chart

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Can I use Arctic Blend™ Universal antifreeze in my diesel truck?

Arctic Blend™ Universal may be used for heavy duty diesel engine applications when combined with Supplemental Coolant Additives (SCA's),

such as Fleetguard® DCA-2. Arctic Blend™ Universal is a premium quality, ethylene glycol base, low silicate product for use in automobile and heavy-duty applications. Consult the engine manufacturer's recommendations for more details.

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Can I use heavy-duty antifreeze for trucks in my car?

You should follow the recommendations of your vehicle's manufacturer regarding the type of antifreeze to use. Passenger cars and heavy-duty trucks may require different inhibitor packages.

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What is an SCA? When should I use an SCA? Does EET sell SCA's?

SCA stands for Supplemental Coolant Additive. Some of the corrosion inhibitors in conventional antifreezes deplete more quickly than others. Adding SCA's can maintain the proper concentration of these inhibitors between antifreeze changes. SCA's can boost the inhibitor concentrations of light duty antifreezes. Always follow the engine manufacturer's recommendations regarding the use of SCA's since some extended life antifreezes do not require SCA's. EET does not sell SCA products.

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What are the nationally recognized standards or specifications for antifreezes?

ASTM D-3306	John Deere 8650-5	EMD M.I. 1748E
ASTM D-4985	MACK	Ford New Holland 9-86
ASTM D-6210	Navistar	Freightliner 48-22880
Case Corp. MS1710	PACCAR	GM 1825
Caterpillar	SAE 1941	GM 1899
Cummins S/B 3666132	Thermo-King	Volvo GM
Detroit Diesel 7SE298	TMC RP 329	Waukesha 4-1974D

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What are the nationally recognized standards or specifications for recycled antifreeze?

ASTM has issued a standard under the fixed designation D-6471 for recycled pre-diluted engine coolant for automobile and light duty service.

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The US government buys antifreeze to a CID specification. Does the US government buy one type of antifreeze for all different types of vehicles?

US government specification CID-A-A-52624 covers requirements for ethylene glycol and propylene glycol antifreeze and allows three different concentrations: 100%, 60%, and 50%. CID-A-A-52624 requires the antifreeze "to be suitable for use in all administrative vehicles, construction and material handling vehicles and equipment, and military ground combat and tactical vehicles and equipment." The US government encourages the use of recycled antifreeze.

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EET's Arctic Blend™ antifreezes are recycled. Are they chemically identical to antifreezes made with virgin materials?

EET uses a patented and patents pending process involving a number of electro-physiochemical operations to remove harmful contaminants from used antifreeze. The contaminant levels in the resulting recycled antifreeze products are as good as and often lower than products made from virgin ethylene glycol.

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How does EET ensure the quality of recycled Arctic Blend™ antifreezes?

EET has its own on-site quality assurance laboratory equipped with a variety of scientific instruments and equipment. EET performs several tests on incoming used antifreeze to verify that it is suitable for recycling. EET also analyzes its finished recycled antifreeze products to ensure that harmful contaminants have been removed and each batch is properly formulated. EET provides a Certificate of Analysis, demonstrating compliance with established antifreeze standards and specifications, with each batch of antifreeze EET blends. EET retains an archive sample from each batch of antifreeze as well.

EET blends each batch of Arctic Blend™ antifreeze exclusively with Fleetguard® tried and tested corrosion inhibitor packages, ensuring optimum performance of Arctic Blend™ antifreeze in your cooling system.

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If I replace antifreeze in my automobile with Arctic Blend™ Universal antifreeze (my automobile is under manufacturer warranty), will it void my warranty with regards to the cooling system?

As long as the Arctic Blend™ formula type is compatible with and equal to the chemistry used in your vehicle, it will not void the warranty. Refer to the **Reference chart** link to establish the compatibility of Arctic Blend™ antifreeze with your cooling system.

Under the Magnuson-Moss Warranty Act (15 U.S.C. 2302) and general guidelines of the Federal Trade Commission, an original equipment manufacturer (OEM) may not make its vehicle warranty conditional on the use of any specific brand of motor oil, oil filter, antifreeze, or any other component unless the manufacturer provides it to the customer free of charge

during the warranty period. If an OEM requires a customer to use its motor oil, oil filters, or antifreeze, the customer should demand the products free of charge. If the demand is refused, the customer should ask for a copy of the warrantor's approved FTC waiver.

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What is the shelf life of Arctic Blend™ Antifreeze/Coolant?

In its original sealed container, Arctic Blend™ Antifreeze/Coolant has a shelf life of at least 5 years.

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Coolant seems to disappear from my system. Where does it go?

Coolant can seem to "disappear" from the system for a variety of reasons icluding the lack of a coolant recovery system, evaporation, hose and clamp leakage or seepage, water pump and/or thermostat issues, cracked cylinder heads or engine blocks, head gasket problems, and leaking radiators, heater cores or oil coolers.

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Why does my coolant foam?

Foam in coolant can result from trapped air in the system, a leak on the suction side of the water pump, an improperly functioning water pump, low or no coolant in the coolant recovery tank, or the lack of a coolant recovery system.

Foaming may also be caused by a lack of anti-foaming agents in the antifreeze. Arctic Blend™ antifreeze products include an antifoam chemical in every formula, and each batch is tested before leaving EET's facility to ensure the ASTM standard for foaming is satisfied.

What is upcycling?

Upcycling is a relatively new term describing the preferred way for recycling materials. When the product(s) of recycling are as good or better quality than the original product, it is considered an upcycled product. EET's Arctic Blend™ recycled antifreeze products are aptly referred to as upcycled, as they meet, and often beat, the internationally recognized standards for antifreeze made from virgin materials.

Each batch of Arctic Blend™ antifreeze is tested for conformance to specifications. The results of these tests are documented in a Certificate of Compliance and provided with each shipment. In addition, EET's antifreeze recycling systems, when operated according to procedure, are designed to produce upcycled antifreeze products.

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What is downcycling?

Downcycling means recycling where the recycled product loses quality characteristics. Most antifreeze recyclers in the USA utilize processes that result in a product of lesser quality than antifreeze products made from virgin antifreeze. These downcycled antifreeze products are typically low-priced, as the recyclers processing steps are minimal and low cost. While these downcycled antifreeze products often look good (removal of suspended solids and the addition of dye can make the product appear like new), the chemistry is often not in conformance with recognized standards nor OEM requirements.

Another example of downcycling is recycling paper. Often, the color and texture of recycled paper is not as good as paper made from wood pulp, even though it is usually more expensive.

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Contact **EET** for more more information about our **antifreeze recycling** services.

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