

Fleetguard[®]



Cooling System Maintenance Products

COOLANT



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REAL™ Solutions.

Fleetguard® Cooling System Maintenance Products

Estimates project that over **40% of total engine repair costs** are related to problems that originate in the cooling system. Repairs are costly and create unnecessary downtime that affects equipment operations and customer deadlines. Fleetguard cooling system products provide unmatched protection with an easy maintenance program so that you can keep your engines running longer with less downtime.

Unmatched Protection

In addition to providing superior freeze and boil over protection, Fleetguard products protect your engine from the most damaging cooling system problems, including:

- Scale
- Corrosion
- Liner pitting

(for the detailed descriptions, please refer to page 4)

Fleetguard coolants are manufactured to the highest standards and meet the performance specifications of all major OEMs. You can depend on Fleetguard cooling system products to provide unmatched protection to your engine.

One Stop Shop

Our comprehensive line of cooling system products includes everything you need to ensure an easy, trouble-free cooling maintenance program:

- Fully Formulated Coolant
FFC = Glycol + Additive + Water
- Extenders and Supplemental Coolant Additives (SCAs)
- Heat transfer fluids
- Cooling system cleaners
- Coolant filters - Standard and Chemically charged

All Fleetguard coolants are compatible with all other coolants available and are suitable for use in all gasoline, diesel, and natural gas engines.

Easy Maintenance System

Fleetguard cooling system maintenance is as simple as 1, 2, 3.

STEP 1

Fill Up

Select the Fleetguard Fully Formulated Lifetime Coolant that meet your needs.

- **PG Plus:** Environmentally friendly premium heavy duty product
- **ES Compleat EG:** Premium heavy duty product
- **Fleetcool:** Premium light to medium duty product

STEP 2

Maintain Additive Level

Test using 3-Way SCA/Freeze Point. Test and maintain additive levels at regular service intervals with liquid additives or chemically charged filters.

- **ESI (Extended Service Interval):** Test every 6 months or every 2,000 hours
- **SSI (Standard Service Interval):** Test every oil change interval up to 500 hours

STEP 3

Check Overall Quality

Check overall coolant condition for replacement or re-use. Use QuikChek Test Kit every 12 months for both SSI and ESI.

Cooling is vital for longer machine life

It can be a costly mistake to disregard proper engine maintenance. If not properly cooled, the temperature of a heavy-duty diesel engine during operation can rise up to 2,000 °C. Regular maintenance and correct coolant is the key to reducing operation costs by lessening the chances of engine failure due to overheating. Over a 24-hour period, about 720,000 Litres of cooling fluid circulate round an average heavy duty machine.

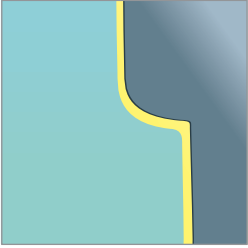
Cummins® recommends Fleetguard Fully Formulated coolant. (Refer to Cummins Engineering Standard: CES 3666132-04)

Fleetguard Coolant Protects your Engine:

Aluminium Corrosion


Corrosion is not a question of age, it can start to attack an engine as early as 2,000 hours.

With Fleetguard Protection:

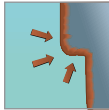


Protective layer created by Fleetguard Fully Formulated Coolant prevents the aluminium from corroding.

Without Fleetguard Protection:



Corrosion affects all metal parts, especially the aluminium ones.

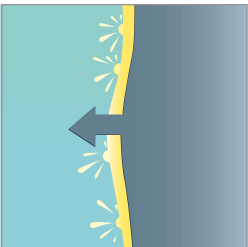


Tiny metal particles begin to circulate in the cooling system, causing damage to mechanical parts.

Cavitation

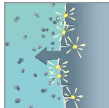
Contradictory movements of the crankshaft causes significant vibration of your engine liners. When the liner vibrates, bubbles collapse under an enormous pressure and take small chunks out of the liner.

With Fleetguard Protection:

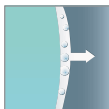


Fleetguard Fully Formulated Coolant can neutralise the fatal effect on your engine by creating a protective layer on the liner wall: implosions now take place on this layer and spare the liner surface.

Without Fleetguard Protection:



Liner surface deforms during vibration which, in combination with the coolant inertia, creates a vacuum and formation of tiny vapour bubbles.

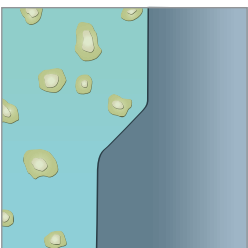


Vibration continues and the liner slams back, causing the bubbles to implode. As this process goes on several thousand times a second, small chunks are kicked out of the liner.

Scaling

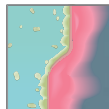
Scale, a major insulator, causes detrimental effects to the hot spots of your engine (the liners and the cylinder heads). The consequences are worn piston rings, higher oil consumption and, in the worst cases, total engine failure.

With Fleetguard Protection:




Fleetguard Fully Formulated Coolants contain an intelligent polymer system that 'wraps up' the scale particles so that they can't attach themselves to the liner wall.

Without Fleetguard Protection:



As the engine functions, the heat causes the formation of scale on the hot surfaces.



The scale shell acts as an insulator, preventing the coolant liquid from absorbing the heat of the engine.

Acidity

Cooling fluid becomes acidic due to the degradation of antifreeze and sulphates entering the cooling system and in turn, damages engine gaskets and other softer metal components. Fleetguard Fully Formulated Coolant act as buffers in your cooling fluid that neutralizes the formation of acids or alkalis.

STEP 1

Fully Formulated Coolant Selection



PG Plus™

- Propylene Glycol based diesel engine coolant with 150,000 miles (250,000 km) or 4,000 hours service intervals
- Easy maintenance with ES Extender or filter
- Best liner pitting, scale and corrosion protection
- For all heavy to light duty applications
- Environmentally friendly; biodegradable
- No Hazchem code
- No poison schedule number and no dangerous goods class
- Satisfies major heavy duty engine and OEM specifications in accordance with TMC RP330, RP338 and ASTM D6211, D5216, D4985, D3306.
- ES Extender extends coolant life 150,000 miles (250,000km) or 4,000 hours

Size	Premix	Concentrate
264 Gal. Tote (1000 L)	CC2867	CC2832
55 Gal. Drum (208 L)	CC2868	CC2659
5.2 Gal. Pail (20 L)	CC2869	CC2658
2.6 Gal. Bottle (10 L)	CC2871	
1 Gal. Bottle (4 L)	CC2870	CC2657



ES Compleat™ EG

- Hybrid Lifetime Coolant with 150,000 mi (250,000 km) or 4000 Hours Service Intervals
- Easy Maintenance with ES Extender or filter
- Best Liner Pitting, Scale and Corrosion Protection
- ES Extender Extends Coolant Life 150,000 mi (250,000 km) or 4000 Hours
- Meets ASTM 6210, TMC RP329 and Performance Specifications of all Major OEMs

Size	Premix	Concentrate
275 Gal. Tote (1040 L)	CC8983	CC8984
55 Gal. Drum (208 L)	CC2826	CC2821
5 Gal. Pail (19 L)	CC2848	CC2847
1 Gal. Bottle (3.78 L)	CC2825	CC2820



Fleetcool™

- Standard lifetime coolant with 30,000 miles (50,000 km) or 500 hours service intervals
- Excellent liner pitting, scale and corrosion protection
- For medium to light duty applications
- Maintain with DCA2 or DCA4 liquids or filters
- Meets ASTM 6210, TMC RP329 and specifications of all major OEMs
- No amine or 2-EH, No carcinogen

Size	Premix	Concentrate
264 Gal. Tote (1000 L)	CC8960	
55 Gal. Drum (208 L)	CC8959	CC8964
5.2 Gal. Pail (20 L)	CC8958	CC8963
1 Gal. Bottle (4 L)	CC8956	CC8962

STEP 2 Additive Maintenance

Additive Level Testing Product

Use 3-way SCA / Freeze Point Strips to test for additive level and coolant dilution. Maintain additive level of Fully Formulated Coolant at optimum level (1.2 to 3.0 units per gallon for imperial measurement, 0.3 to 0.8 units per Litre for metric measurement) for maximum protection.



3-way SCA/Freeze Point Strips

- Easy to use test strips to measure protection against liner pitting, corrosion and coolant dilution
- Measures freeze point and Molybdate/Nitrate
- Results in 45-75 seconds

50/Bottle	25 4-Packs/Box	100 Singles/Box	50/Bottle (Metric)	25 4Packs (Metric)
CC2602	CC2602A	CC2602B	CC2602M	CC2602AM

Additive Maintenance Products

Select the corresponding Additive Maintenance Product (Liquid Additive or Water Filter with chemical release) for proper coolant maintenance.

Option A: Liquid Additive Products

ESI Extended Service Interval

Test/replenish the additive level every 6 months or 2,000 hours



ES Extender™

An alternative organic based chemical replacement to the ES slow release ES Chemical Filters. To extend coolant protection life add after one year or 250,000 km or 4,000 hours to boost PG Plus™ coolant for another service interval.

- Low in TDS (Total Dissolved Solids) reducing water pump seal wear
- Optimizes total coolant life and reduces disposal costs

Size	Part #
.946lt	CC2840

SSI Standard Service Interval

Test/replenish the additive level at every oil change maintenance interval of up to 500 hours



Liquid Supplemental Coolant Additives (SCAs): DCA4

- Superior liner pitting, scale & corrosion protection using phosphate/molybdate based inhibitor package

Size	DCA4 SCA	Units of DCA4 SCA
55 Gal. Drum (208 L)	DCA80L	2,200
5 Gal. Pail (19 L)	DCA75L	200
1 Gal. Bottle (3.78 L)	DCA70L	40
.5 Gal. Bottle (2 L)	DCA65L	20
1 Pint Bottle (.5 L)	DCA60L	5

Option B: Chemically Charged Water Filter Products

Water filtration is proven to reduce wear and to maintain effective heat transfer. Additionally, water filters can provide a convenient and reliable method for delivering supplemental coolant extenders into the cooling system to improve performance and extend coolant service life.

ESI Extended Service Interval

Test/replenish the additive level every 6 months or 2,000 hours



Extended Service Water Filters

- Maintenance-free up to 12 months, 150,000 miles (250,000 km) or 4000 hours
- Patented slow-release mechanism replenishes chemicals depleted by use
- StrataPore™ multilayered media offers superior durability, efficiency and capacity
- Improved mechanical design for increased durability and corrosion resistance

Thread Size	Additive Per Filter	Part #
11/16-16 UN-2B	15 units DCA4	WF2121
3/4-20 UNEF-2B	15 units DCA4	WF2124
M16 X 1.5-6H INT	15 units DCA4	WF2128
M36 X 2-6G INT	15 units DCA4	WF2126
11/16-16 UN-2B	15 units DCA2	WF2131
3/4-20 UNEF-2B	15 units DCA2	WF2133
M16 X 1.5-6H INT	15 units DCA2	WF2138
1-16 UN-2B	15 units DCA2	WF2136

SSI Standard Service Interval

Test/replenish the additive level at every oil change maintenance interval of up to 500 hours



Standard Service Water Filters

- For use up to 500 hours or 25,000 miles (40,000 km)
- Immediate release filters for use with any coolant at standard service interval
- High quality filtration for efficient removal of harmful contaminants

Thread Size	Additive Per Filter	Part #
11/16-16 UN-2B	5 units DCA4	WF2093
11/16-16 UN-2B	2 units DCA4	WF2070
11/16-16 UN-2B	4 units DCA4	WF2071
11/16-16 UN-2B	6 units DCA4	WF2072
11/16-16 UN-2B	8 units DCA4	WF2073
11/16-16 UN-2B	9 units DCA4	WF2087
11/16-16 UN-2B	4 units DCA4	WF2151
3/4-20 UNEF-2B	8 units DCA4	WF2015
5.43 (137.92)	12 units DCA4	WF2074
11/16-16 UN-2B	15 units DCA4	WF2075
11/16-16 UN-2B	23 units DCA4	WF2076
3/4-20 UNF-2B	4 units DCA4	WF2083
11/16-16 UN-2B	15 units DCA4	WF2104
11/16-16 UN-2B	4 units DCA4	WF2106

Thread Size	Additive Per Filter	Part #
M16 X 1.5-6H INT	8 units DCA4	WF2108
1-16 UN-2B	8 units DCA4	WF2022
1-16 UN-2B	6 units DCA4	WF2082
11/16-16 UN-2B	4 units DCA2	WF2051
11/16-16 UN-2B	8 units DCA2	WF2088
11/16-16 UN-2B	15 units DCA2	WF2054
11/16-16 UN-2B	12 units DCA2	WF2144
11/16-16 UN-2B	8 units DCA2	WF2069
M16 X 1.5-6H INT	8 units DCA2	WF2096
11/16-16 UN-2B	18 units DCA2	WF2145
11/16-16 UN-2B	8 units DCA2	WF2053
11/16-16 UN-2B	23 units DCA2	WF2055
11/16-16 UN-2B	14 units DCA2	WF2091
11/16-16 UN-2B	34 units DCA2	WF2056

STEP 3

Test For Coolant Condemnation

Coolant Overall Quality Testing

Every good cooling system maintenance program should include regular coolant testing to determine if the proper level of protection is present or if contaminants exist. A good coolant testing program eliminates guesswork and allows the cooling system to maintain peak performance.



Quik-Chek Coolant Quality Strips

- Easy to use test strips measures levels of pH, sulfate and chloride for overall coolant quality and solder bloom—without disassembling your cooling system
- Minimizes unnecessary draining of coolant still within specifications
- Test coolant every 12 months for overall quality

50/Bottle	25 4-Packs/Box	100 Singles/Box	50/Bottle (Metric)	25 4Packs (Metric)
CC2602	CC2602A	CC2602B	CC2602M	CC2602AM

Coolant Flushing Products: Radiator Cleaners

Cummins Filtration offers two types of cleaners to keep your cooling system in top condition. Both Restore™ and Restore Plus™ remove contaminants without harming metal surfaces, gaskets, hoses or plastic parts. They are also approved by Cummins® as the preferred product for cleaning oil contaminated cooling systems under warranty maintenance.



Restore

- Alkaline-based chelating cleaner
- Most effective cooling system oil/fuel contamination-cleaning agent on market
- Removes silicate gel
- 10 times more effective than automotive distributor detergent powders
- Safe for use in aluminum radiators and heaters

Size	Part #
55 Gal. Drum (208 L)	CC2612
1 Gal. Bottle (3.78 L)	CC2610



Restore Plus

- Mild acid-based chelating cleaner
- Safely removes rust, corrosion, scale, and solder bloom—without disassembling your cooling system

Size	Part #
55 Gal. Drum (208 L)	CC2637
1 Gal. Bottle (3.78 L)	CC2638

Accessories



Water-Chek™ H₂O 3-Way Test Strips

- Easy to use test strips to determine if coolant make-up water meets OEM, TMC and ASTM specifications
- Measures pH, Chloride and hardness

Size	Part #
100 Singles Strips/Box	CC2609



Filter Head Assembly

- Head assembly for installation on engines without water filtration capability
- Assemblies provide everything needed to achieve benefits of water filtration

Part		
Std Single Head		204163S
Inlet & Outlet		3/8" NPT
Std Single Bracket		256535S
Head & Bracket Assembly		257715S
Severe Service Head		3904378S
Similar to 204163S with steel thread spud.		
Std Single Retro Kit		WFK1
Components		
Std Single Head		204163S
Bracket		256535S
2 x Bronze Valve		3/8" NPTF
2 x Bronze Tail Connector		3/8" NPTF
Duel Head		215617S
Inlet & Outlet		1/2" NPT
Mounting Bracket		256535S



Refractometer

- Determines the freeze point protection for Ethylene Glycol and Propylene Glycol coolants
- More accurate than test strips or float-type hydrometers
- Durable storage case included

Size	Part #
Standard	CC2806

Accessories

Non-Chemical Water Filters

Blank Water Filters without additive chemical are another option when using the Liquid Additive Maintenance Program (Step 2: Option A). It provides high quality filtration for efficient removal of harmful contaminants as well as a secondary cooling system investigation process via physical analysis of used Water Filters.

ESI Extended Service Interval



Extended Service Water Filters

- Maintenance-free up to 12 months, 150,000 miles (250,000 km) or 4,000 hours
- StrataPore™ multilayered media offers superior durability, efficiency and capacity
- Improved mechanical design for increased durability and corrosion resistance

Thread Size	Additive Per Filter	Part #
11/16-16 UN-2B	0, Blank Filter	WF2122
M16 X 1.5-6H INT	0, Blank Filter	WF2129
3/4-20 UNEF-2B	0, Blank Filter	WF2134
11/16-16 UN-2B	0, Blank Filter	WF2123
M16 X 1.5-6H INT	0, Blank Filter	WF2130
11/16-16 UN-2B	0, Blank Filter	WF2139
M36 X 2-6G INT	0, Blank Filter	WF2127
1-16 UN-2B	0, Blank Filter	WF2137

SSI Standard Service Interval



Standard Service Water Filters

Thread Size	Additive Per Filter	Part #
11/16-16 UN-2B	0, Blank Filter	WF2077
3/4-20 UNEF-2B	0, Blank Filter	WF2078
11/16-16 UN-2B	0, Blank Filter	WF2101
M16 X 1.5-6H INT	0, Blank Filter	WF2109
11/16-16 UN-2B	0, Blank Filter	WF2084
11/16-16 UN-2B	0, Blank Filter	WF2107

Coolant Product Glossary

Have a technical question about a Cummins Filtration product? From filtration and exhaust systems to coolant products. We can answer your most pressing maintenance questions.

Antifreeze: A formula with ethylene glycol or propylene glycol base that contains supplemental coolant additives (SCAs) and/or Organic Acids to prevent corrosion, foaming and other damage to cooling system components. It must be mixed with water before it is used! The most common mixture is 50% each.

ASTM: American Society for Testing of Materials (www.astm.org), the most important standards-setting organization in the world, publishes specifications most commonly cited, ASTM D-3306 for cars and ASTM D-6210 (new) and ASTM D-4985 (old) for trucks.

Borate: A pH buffer used in some antifreezes and SCAs (supplemental coolant additives) to maintain the pH of coolant as it ages.

Carboxylates: Organic acids that have the chemical fragment COOH in the molecule. In orange coolant, such as GM DEXCOOL®, some of the anti-rust inhibitors are from this chemical family.

Charge: To charge or pre-charge a heavy-duty coolant, add 3% SCA to a 50% low silicate ASTM 4985 specification antifreeze and 50% water mix. In water, 6% SCA is usually the pre-charge dose.

Coolant: The fluid formulation in the cooling system, usually half antifreeze and half water.

Coolant Filter: A filter through which coolant flows and widely used as delivery device for SCA chemicals. Care is necessary to ensure the proper application, containing the proper chemical dose, is used. Extended life, slow release coolant filters are now used with extended life coolants.

DI Water: Water purified by deionization. It is chemically pure and contains no calcium, magnesium, chloride or sulfate as found in many tap waters. It is recommended as the make-up for coolant, especially extended service coolants.

Esters: A chemical family found in some recycled antifreezes. These chemicals quickly deplete the inhibitor package, acidify the coolant and cause catastrophic cooling system failure in remarkably short periods of time.

Ethylene Glycol: The most common antifreeze base. At 50% in water, EG antifreeze provides freeze protection to -34° F. EG can be harmful if ingested.

Freeze Point: The point where ice crystals begin to form in coolant as stated by ASTM method D 1177.

Fully Formulated: This term describes the new heavy-duty coolants that contain all chemicals necessary to protect diesel as well as automotive cooling systems. The ASTM specification for fully formulated coolant, ASTM D-6210, requires simultaneous compliance with all of the previous automotive and heavy-duty specifications. Therefore, this is a true universal antifreeze specification and may be used in any system.

Hybrid Coolant: Coolant made with a chemical additive package that contains a combination of organic acids and conventional corrosion inhibitors.

Molybdate: In the Fleetguard DCA-4, SCA, and coolant technology, a component to prevent cylinder liner cavitation and protect hard and soft metals from corrosion.

Nitrate: A general anti-corrosion additive that is especially effective in protecting aluminum and solder.

Nitrite: Additive present in all good SCAs and fully formulated antifreezes (ASTM spec D-6210) that is the most important additive for preventing cylinder liner cavitation.

Coolant Product Glossary

Organic acid: A large family of chemicals usually used to refer in antifreeze discussions to carboxylate inhibitors (see carboxylates).

pH: A scale that indicates the acidity or alkalinity of a fluid or solution. The scale runs from 0 to 14 with values below 7 being acidic and those above 7 being alkaline. Antifreeze/coolant and SCA solutions run in the alkaline to mildly alkaline range of 7.5 to 11.0. A coolant or SCA solution will become unstable if the pH drops too much with use. Minimum acceptable pH depends on the type of coolant. Rapid additive depletion/precipitation and corrosion is likely once the coolant pH falls below the lower limit.

Phosphate: A pH buffer used in many coolants. Detroit Diesel® does not recommend phosphated coolants.

Pre-charged: A term to describe antifreeze that contains SCA. It is now obsolete; the term fully formulated is preferred.

Propylene Glycol: An alternative, slightly more expensive antifreeze base fluid that is environmentally friendlier than ethylene glycol due to its lower toxicity. Provides excellent corrosion protection.

Reserve Alkalinity: The ability of a coolant to resist aging as reflected by the amount of hydrochloric acid required to put the pH down to 5.5 in an ASTM test.

SCA: An acronym for supplemental coolant additive which is a chemical package added to coolant either as a liquid, powder or charge inside a filter to fortify the coolant's anticorrosive and other desirable properties. SCAs that meet the ASTM SCA specification are strongly preferred for maximum protection.

Silicate: The best protection against aluminum corrosion. However, silicate has limited solubility in coolant and is often associated with radiator plugging in poorly formulated coolants or SCAs. High quality coolants contain silicate stabilizers.

Silicate Stabilizer: A chemical used in the best coolants and SCAs to prevent silicate drop-out, which may cause problems.

Specific Conductance: A coolant's ability to resist carrying an electrical current between dissimilar metals. Excessive levels can be due to improper source water, high metal corrosion or over-treatment with SCAs.

Total Dissolved Solids: A measure of the total amount of additives, make-up water minerals, and contaminants in a coolant.

Total Hardness: A calculation of calcium carbonate and magnesium carbonate - an indication of scale deposit formation. ASTM, TMC, and OEM specifications are based on Total Hardness.



For more information, visit cumminsfiltration.com

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