Estimates project up to 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 various maintenance programs to meet your needs and keep your engines running longer with less downtime.

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 Heavy Duty Antifreeze Coolants
- Supplemental Coolant Additives (SCAs)
- Cooling System Cleaners
- Coolant Filters – Standard and Chemically Charged
- Field and Laboratory Testing

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

1. Fill with long life coolant that meets your needs.
2. Properly top off system using the pre-diluted coolant.
3. Test with our simple dip and read test strips and maintain as needed.

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:
- Corrosion
- Liner Pitting/Cavitation
- Scale & Deposits
- Acidification

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

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

Acidification
Coolants acidify due to the degradation of antifreeze and combustion gases entering the cooling system, which can damage cooling system components. Fleetguard Fully Formulated Coolants buffer the coolant to prevent and neutralize the formation of acids.

Fleetguard Fully Formulated Coolants contain a proprietary polymer system that ‘wraps up’ the scale particles so that they can’t attach themselves to the hot metal surfaces.

With Fleetguard Protection:
- Protects against unnecessary downtime caused by cooling system problems.
- Keep your engines running longer with less downtime.

Without Fleetguard Protection:
- Corrosion affects all metal parts, especially aluminium.
- Corrosion products and tiny metal particles begin to circulate in the cooling system, causing erosion damage to mechanical parts.

Liner Pitting/Cavitation
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 prevent 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.
- Protective layer created by Fleetguard Fully Formulated Coolant prevents corrosion and erosion.

Without Fleetguard Protection:
- Piston-slap causes liner vibration, which creates a vacuum and formation of tiny vapor bubbles.
- The liner slams back into the coolant causing the bubbles to implode. As this process repeats many times per second, small chunks are kicked out of the liner.

Scale & Deposits
Scale causes detrimental effects to the hot surfaces of your engine cooling system (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 a proprietary polymer system that ‘wraps up’ the scale particles so that they can’t attach themselves to the hot metal surfaces.

Without Fleetguard Protection:
- As the engine functions, the heat causes the formation of scale on the hot surfaces.
- The scale layer acts as an insulator, preventing the coolant from absorbing the heat of the engine.
Select Fully Formulated Coolant

**ES Compleat™**

**ES Compleat OAT**
- Organic Additive Technology coolant for use in all heavy duty and light duty diesel and gas engines.
- Life-of-the-Engine, 1,000,000-mile coolant.
- Protects against liner pitting and provides solid corrosion protection for aluminum, cast iron, copper, brass, and solder.
- Contains proprietary scale inhibitors. Compatible with gaskets, elastomers, non-metals, including silicon seals/hoses.
- Fully formulated hybrid coolant (antifreeze) with dual borate, phosphate buffer and low silicate formulation for use in all heavy duty diesel and gas engines.
- Life-of-the-Engine, 1,000,000-mile coolant.
- Protects against liner pitting and provides solid corrosion protection for aluminum, cast iron, copper, brass, and solder.
- Contains proprietary scale inhibitors. Compatible with Fleetguard DCA4 liquid, or DCA4 chemical filters.
- Available in Ethylene Glycol based 50/50, 60/40 premix or concentrate.

**ES Compleat NOAT**
- Nitrite Organic Additive Technology for use in Heavy Duty applications.
- Life-of-the-Engine, 1,000,000-mile coolant with use of Extender at 600,000 miles.
- Provides maximum liner pitting protection with nitrite/molybdate.
- Improved water pump life through a borate/phosphate/silicate free formula.
- Less susceptible to contamination than hybrid and conventional technologies.
- Compatible with gasket and hose materials (including silicone seals and hoses).
- Meets ELC, NMA1, and EC-1 systems.

**ES Compleat**
- Fully formulated hybrid coolant (antifreeze) with dual borate, phosphate buffer, and low silicate formulation for use in all heavy duty diesel and gas engines.
- Life-of-the-Engine, 1,000,000-mile coolant.
- Protects against liner pitting and provides solid corrosion protection for aluminum, cast iron, copper, brass, and solder.
- Contains proprietary scale inhibitors.
- Compatible with Fleetguard DCA4 liquid, or DCA4 chemical filters.
- Available in both ethylene or propylene glycol base as either a 50/50, 60/40 premix or concentrate.

**Select Fully Formulated Coolant**

**Fleetcool™**

**Fleetcool EX**
- Fully formulated phosphate-free hybrid coolant (antifreeze) for use in all heavy duty diesel and gas engines.
- Life-of-the-Engine, 1,000,000-mile coolant.
- Protects against liner pitting and provides solid corrosion protection for aluminum, cast iron, copper, brass, and solder.
- Contains proprietary scale inhibitors.

**Fleetcool**
- Cost-effective standard life coolant (antifreeze) with borate buffer and low silicate formulation for use in all heavy duty diesel and gas engines.
- Product need not be drained and replaced until condemnation limits are reached.
- Protects against liner pitting and provides solid corrosion protection for aluminum, cast iron, copper, brass, and solder.
Maintain Additive Levels

Coolant Additives

Liquid Supplemental Coolant Additives (SCAs)

DCA2
- Standard Corrosion Protection Using Borate/Nitrite Based Inhibitor Package

DCA4
- Superior Liner Fitting, Scale & Corrosion Protection Using Phosphate/Molybdate Based Inhibitor Package

Maintain Additive Levels

Coolant Filtration

Coolant filtration is proven to reduce wear and to maintain all cooling system components. Additionally, water filters can provide a convenient and reliable method for delivering supplemental coolant additives into the cooling system to improve performance and extend coolant service life.

Standard Service Water Filters
- Use at OEM recommended standard service intervals
- Immediate Release SCA for use with any coolant at Standard Service Interval
- High quality cellulosic media, which is 95% efficient at 60 microns
- For use up to 1500 hours or 75,000 miles

Extended Service Water Filters
- Easy Maintenance every 12 months, 150,000 miles (250,000 km), or 4000 hours
- Patented Slow-Release Mechanism Replenishes Chemicals Depleted by Use
- "StrataPro™" Multi-layer Media offers Superior Durability, Efficiency and Capacity
- Improved Mechanical Design for Increased Durability and Corrosion Resistance

Non-Chemical Filters
- For use at OEM Recommended Standard Service Intervals
- High quality cellulosic media, which is 95% efficient at 60 microns
- For use up to 1500 hours or 75,000 miles

Filter Head Assembly
- Head Assembly for Installation on Engines without Water Filtration Capability
- Assemblies Provide Everything Needed to Achieve Benefits of Coolant Filtration

*Severe Duty Filter Head is recommended for most applications.
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.

### Coolant Testing

#### 4-Way ES Compleat OAT Test Kit
- Easy to use test strips measure Molybdate, Nitrite, Freeze point, and pH
- Results in 45-75 Seconds
- Designed specifically for use with ES Compleat™ OAT

#### 3-Way SCA/Freeze Point Strips
- Measures Protection against Liner Pitting, Corrosion and Coolant Dilution
- Easy to Use Test Strips Measure Freeze Point and Molybdate/Nitrite
- Results in 45 – 75 Seconds

#### QuikChek Coolant Quality Strips
- Easy to Use Test Strips Measure Levels of pH, Sulfate and Chloride for Overall Coolant Quality
- Minimizes Unnecessary Draining of Coolant still within Specifications

#### Water-Chek 3-Way Strips
- Determines if Coolant Make-Up Water Meets OEM, TMC and ASTM specifications
- Easy to Use Test Strips Measure pH, Chloride and Hardness

---

**4-Way ES Compleat OAT Test Kit**

| 50 Strip Test Kit | CC8997 |

**3-Way SCA-Freeze Point Strips**

<table>
<thead>
<tr>
<th>50/Bottle</th>
<th>25 4-Packs/Box</th>
<th>100 Singles/Box</th>
<th>50/Bottle (Metric)</th>
<th>25 4-Packs (Metric)</th>
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</thead>
<tbody>
<tr>
<td>CC2602</td>
<td>CC2602A</td>
<td>CC2602B</td>
<td>CC2602M</td>
<td>CC2602AM</td>
</tr>
</tbody>
</table>

**QuikChek Coolant Quality Strips**

| 10/Bottle | CC2718 |

**Water-Chek 3-Way Strips**

| 100 Singles/Box | CC2609 |
Test and Maintain Coolant Regularly

Coolant Testing

<table>
<thead>
<tr>
<th>Refractometer</th>
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</thead>
<tbody>
<tr>
<td>Determines the Freeze Point Protection for Coolants</td>
</tr>
<tr>
<td>More Accurate than Test Strips or Float-Type Hydrometers</td>
</tr>
<tr>
<td>Durable Storage Case Included</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Refractometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene Glycol or Propylene Glycol</td>
</tr>
<tr>
<td>Glycerin</td>
</tr>
<tr>
<td>ES Complete™ OAT</td>
</tr>
<tr>
<td>CC2806</td>
</tr>
<tr>
<td>CC36049</td>
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<tr>
<td>CC36996</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Monitor-C Laboratory Testing - Coolant Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expert Laboratory Analysis with Online Reporting, Results in 24 Hours</td>
</tr>
<tr>
<td>Measures Molybdate, Nitrite, pH, Hardness, Chloride, Sulfates, Corrosion Products (iron, lead, etc), and Silicates</td>
</tr>
<tr>
<td>Tests for Freeze/Antifreeze Points, TDS and Buffers</td>
</tr>
<tr>
<td>Available in Both Standard Packaging and with a Prepaid Mailer</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Monitor-C Laboratory Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Kit</td>
</tr>
<tr>
<td>Standard Kit with Prepaid Mailer</td>
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<tr>
<td>CC2700</td>
</tr>
<tr>
<td>CC2706</td>
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</tbody>
</table>

Cooling System 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.

<table>
<thead>
<tr>
<th>Restore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkaline-Based Cleaner</td>
</tr>
<tr>
<td>Most Effective Cooling System Oil/Fuel Contamination-Cleaning Agent on Market</td>
</tr>
<tr>
<td>More Effective than Automotive Distributor Detergent Powders</td>
</tr>
<tr>
<td>Safe for Use in Aluminum Radiators and Heaters</td>
</tr>
<tr>
<td>Removes Silicate Gel</td>
</tr>
<tr>
<td>Approved by Cummins</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Restore</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Gallon Bottle (3.78 L)</td>
</tr>
<tr>
<td>5 Gallon Pail (19 L)</td>
</tr>
<tr>
<td>55 Gallon Drum (208 L)</td>
</tr>
<tr>
<td>CC2610</td>
</tr>
<tr>
<td>CC2611</td>
</tr>
<tr>
<td>CC2612</td>
</tr>
</tbody>
</table>
Cooling System Cleaners

**Restore Plus**
- Safely Removes Rust, Corrosion, Scale, and Solder Bloom – Without Disassembling your Cooling System
- Mild Acid-Based Chelating Cleaner

<table>
<thead>
<tr>
<th>Restore Plus</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1 Gallon Bottle (3.78 L)</td>
<td>CC2638</td>
</tr>
<tr>
<td>55 Gallon Drum (208 L)</td>
<td>CC2637</td>
</tr>
</tbody>
</table>

Test and Maintain Coolant Regularly

Plastic Totes

**Caged Plastic Tote**
- Strong resistance to harsh service and weather environment
  - Longer container life
  - No core charge
  - Compatible with coolant pumps SP1580 & SP1581

Coolant Pumps

**Electric Tote Drum Pump**
- SP1582
  - Perfect for dispensing Coolant and DEF from 55-gallon plastic and steel drums
  - Self-Priming Submersible Pump
  - 10 ft Dispense Hose
  - Flow Rates up to 5 GPM
  - Integrated Nozzle Holder
  - Compatible with DEF

**Electric Tote Pump**
- With flowmeter: SP1580
  - Self-priming
  - Stainless steel motor shaft
  - Polypropylene housing
  - Flow rate 7-9 GPM
  - 1.15V (60Hz), 0.44HP
  - Operating pressure 1.6 bar (25 PSI)
- Without flowmeter: SP1581
Coolant Product Glossary

**Antifreeze**: A mixture of glycol or glycerin base plus an additive package. The base provides freeze and boil over protection, while the additive package prevents corrosion, liner pitting, and the formation of scale and deposits.

**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 for trucks, and ASTM D-4985 for old trucks.

**Conventional Coolant**: A coolant whose additive package is made up entirely of conventional additives such as borate, molybdate, nitrite, nitrate, phosphate, and silicate.

**Coolant**: The fluid in the cooling system. Typically it will be composed of 50% antifreeze concentrate and 50% water.

**Coolant Bases**: Chemicals used in antifreeze to lower freeze point and increase boil point. The most common coolant bases include ethylene glycol (EG), diethylene glycol (DEG), propylene glycol (PG), and glycerin.

**Coolant Types**: Coolants are divided into three types depending on the chemicals used in the additive package. The three coolant types are: conventional, organic acid or OAT, plus hybrid.

**Fully Formulated Coolant**: Another term for a heavy duty antifreeze/coolant. Unlike light duty coolant, a fully formulated coolant contains additives to prevent liner pitting and scale/deposit formation.

**Heavy Duty Coolant**: Fully Formulated to provide buffering capacity, corrosion, erosion, and liner pitting protection. Also provides foam, scale, and deposit control.

**Light Duty Coolant**: Formulated to provide buffering capacity, corrosion protection, and control foam tendencies.

**Molybdate**: A conventional coolant additive used in premium, long life coolants. Molybdate when used with nitrite provides optimum liner pitting protection as well as increases a coolant’s ability to protect aluminum.

**Nitrite**: A conventional additive found in many heavy duty SCAs and antifreezes. Nitrite provides excellent liner pitting as well as steel and cast iron corrosion protection.

**OAT Coolant**: Organic Acid Technology Coolant. Composed primarily of organic acids with very limited or no use of conventional additives.

**Organic Acid**: Type of coolant additive that has become much more popular in the past 10 years. Organic acids are also referred to by the term carboxylate. There are several organic acids commonly used in coolants such as benzoic, sebacic, adipic, etc.

**Phosphate**: A conventional coolant additive used to provide buffering capacity plus aluminum corrosion protection. Detroit Diesel along with some European OEMs do not recommend coolants that contain phosphate.

**Precharged**: A term used to describe the addition of SCA to a light duty coolant to make it acceptable for heavy duty service. This practice is now seldom used with the wide availability of fully formulated heavy duty coolant.

**Premix Coolant**: Coolant where the antifreeze concentrate is already cut with water and delivered to the customer ready to use. Water content of premix coolant generally runs in the 40% to 60% range depending on climate and altitude.

**Reserve Alkalinity**: The measure of a coolants ability to resistant pH change caused by exhaust gas leakage into the cooling system plus the thermal breakdown of glycols.

**SCA**: Supplemental Coolant Additive. The products are available in liquid form or a solid contained within a coolant filter. SCAs are a mixture of chemicals that provide corrosion, liner pitting, and scale/deposit control similar to the additive package in an antifreeze. They can be used to replenish the additives in an antifreeze coolant or used alone in water only coolant.

**Total Hardness**: The amount of both calcium (as CaCO3) and magnesium (as MgCO3) in a make-up water which indicates the potential to form scale and deposits in the cooling system. EMA, ASTM, and TMC limit make-up water total hardness to 170 ppm.

Have a technical question about a Cummins Filtration product? From filtration to coolant products, we can answer your most pressing maintenance questions.

For detailed technical information about all products featured in this brochure, refer to the Fleetguard Technical Information Catalog, LT32599. Some part numbers may not be available in all countries. Contact your local customer assistance center for product availability.