



6/26/2013

90 - FYI – COOLANT COMPATIBILITY MATRIX.

Coolant Definitions

HEAVY DUTY conventional coolants are antifreeze products treated with some or all of the following inorganic corrosion inhibitors: Nitrite, Molybdate, Borate, Phosphate, and Silicate.

HYBRID coolants are composed of organic acid technology combined with strong inorganic buffer agents like Borate or Phosphate.

FULL OAT coolants are antifreeze products whose primary inhibitor package is composed of organic acid compounds with minimal or no amounts of buffer agents.

OAT coolants containing 2-ethyl hexanoic acid (2-EH) were originally introduced by Texaco, Inc.

“Other” OAT coolants are composed of other proprietary organic acid combinations instead of 2-ethyl hexanoic acid.

AUTOMOTIVE High Silicate antifreeze contains large doses of silicate additives for the protection of light duty automobiles and trucks with aluminum cooling system components. They should never be used with supplemental coolant additives on a regular basis.

Where coolants composed of 2-EH acid show as **APPROVED** for Cummins (**X****), a special silicate additive liquid or silicate filter is required to protect specific gasket materials in the engine.

OAT COOLANTS when used in a **CUMMINS HEAVY DUTY ENGINE** **REQUIRE** the above special silicate additive liquid OR a silicate filter.

HOWEVER based on information on page 7 of the Cummins Service Bulletin # 3666132-06 written March 18, 2013 the Cummins ISL engine **IS NOT CONSIDERED A HEAVY DUTY ENGINE**, Cummins considers the ISL a **MID-RANGE ENGINE**.

TIFFIN USES SHELL ROTELLA® EXTENDED LIFE COOLANT AS THE OEM COOLANT FOR THE POWERGLIDE CHASSIS.

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consider extended service and use the standard service interval as described in Section 2. Coolant **must** meet the requirements stated in this section.

It is preferred and recommended for all Cummins® engines to top off **only** with fully formulated coolants which meet Cummins Engineering Standard 14603. See Attachment 2 for more information on Cummins Engineering Standard 14603. However, MidRange products, including any Cummins® engine displacing less than 10 liters [610 C.I.D.], may top off with fully formulated coolants meeting a minimum requirement of ASTM D6210.

Cummins Inc. recommends Fleetguard® Antifreeze Coolants including ES Compleat containing DCA4 Plus, Fleetcool EX containing DCA2 Plus, and ES Compleat organic acid technology (OAT), which meet the requirements of Cummins Engineering Standard 14603.

Cummins® Engines That are Using Chevron® Texaco™ or Shell™ Rotella™ Extended Life Coolant (TELC) Plus Silicates

OAT coolants, such as Chevron® Texaco™, Shell™ Rotella™ or their private label counterparts, which do **not** meet the elastomer compatibility section of Cummins Engineering Standard (CES) 14603, are acceptable for extended service interval use in Heavy-Duty and High Horsepower engines if the initial coolant fill requirements were met by the vehicles' original equipment manufacturer (OEM), (including the addition of silicates). See Cummins AEB 90.47 which can be accessed on <http://www.gce.cummins.com>. All midrange engines are TELC compatible without the addition of silicates.

Heavy-Duty and High Horsepower engines requiring overhauls or repairs involving the replacement of the following components that are using OAT coolants **not** meeting CES 14603, **must** discard the original coolant and replace with new.

- Rocker lever housing
- Oil cooler housing
- Cylinder head gasket
- Thermostat housing gasket
- Oil cooler cover gasket
- V cavity gasket

If the replacement coolant is Chevron® Texaco™, Shell™ Rotella™ or their private label counterparts, which do **not** meet the elastomer compatibility section of CES 14603, the coolant **must** be treated by adding 0.24 liter [8 oz] of liquid silicate fluid for every 45 liters [12 gal] of total coolant system volume. It is critical to **not** over treat the coolant with silicate fluid. If over-treatment is suspected, drain the cooling system and discard the filter. Clean the cooling system immediately. Symptoms of silicate over-treatment can be thickened coolant in the lower radiator tank, water pump seal leakage soon after silicate addition, reduced heater output and/or elevated engine temperatures. Use Fleetguard® Restore™ Cooling System Cleaner at the rate of 3.8 liters [1 gal] per 38 to 45 liters [10 to 12 gal] of water. Do **not** use Restore with normal engine coolant.

Ethylene Glycol (EG) Coolants North American Market	Color	Inhibitor Package									Meets Specifications			
		Light Duty		Heavy Duty				Notes				OEM		
		Conventional High Silicate	Conventional Low Silicate w/out SCA	Conventional Fully Formulated with SCA	Hybrid (HOAT)	OAT (2-ethyl-hexanoic acid)	OAT (Other organic acid)	w/out Silicate	w/out Phosphate	w/out Borate	Full OAT	Cat	Cummins	DDC
Passenger Car High Silicate	Green	X												
Artic Blend™ Universal	Green		X											
Fleetguard Universal™ Low Silicate	Green		X											
Fleetguard Universal™ Recycled Coolant	Green		X											
Shell Shellzone® Low Silicate	Green		X											
Universal Low Silicate	Green		X											
Artic Blend™ HD Fully Formulated	Pink			X				X			X	X	X	
Cat® Diesel Engine Antifreeze Coolant	Pink			X				X			X	X	X	
Detroit Diesel PowerCool®	Pink			X				X			X	X	X	
Fleetguard ES Compleat™	Blue			X							X	X	X	
Fleetguard Fleetcool™	Pink			X				X			X	X	X	
Fleetguard Fleetcool™ Recycled Coolant	Green			X				X			X	X	X	
Old World Industries Fleet Charge®	Pink			X				X			X	X	X	
Prestone® Heavy Duty	Pink			X				X			X	X	X	
Artic Blend™ G-Plus	Yellow				X			X						
DiamlerChrysler / Mopar® 2003	Orange				X			X			X			
Fleetguard Fleetcool™ EX	Pink				X			X			X	X	X	
Ford Motorcraft® Premium Gold	Yellow				X			X						
Peak CF-EXL® Extended Life Coolant	Yellow				X			X						
Valvoline Zerex® G-05	Yellow				X			X						
CAT® ELC	Red					X		X	X	X	X	X	X**	X
Chervron Texaco Delo™ Extended Life Coolant	Red					X		X	X	X	X	X	X**	X
GM DEX COOL®	Orange					X		X	X	X	X			
Prestone® Extended Life 5/150	Orange					X		X	X	X	X			
Shell Rotella® Extended Life Coolant	Red					X		X	X	X	X	X	X**	X
Texaco Havoline® DEX-COOL®	Orange					X		X	X	X	X			
Texaco Havoline® Extended Life Coolant	Red					X		X	X	X	X	X	X**	X
Valvoline Zerex® ExtremeLife™ 5/150	Orange					X			X	X	X			
Valvoline Zerex® Extended Life Extreme 3/300	Red					X			X	X	X	X	X	X
Detroit Diesel Powercool Plus®	Red						X	X	X	X	X	X	X	X
Old World Industries Final Charge®	Red						X	X	X	X	X	X	X	X
Fleetguard ES Optimax™	Red						X	X	X	X	X	X	X	X
Compatibility ***														
Conventional High Silicate		X												
Conventional Low Silicate w/out SCA			X											
Conventional Fully Formulated with SCA				X	X									
Hybrid (HOAT)				X	X	X	X							
OAT (2-ethyl-hexanoic acid)						X	X							
OAT (other organic acid)						X	X							
										Comments				
										* Do not use SCA with conventional high silicate antifreezes				
										** Requires special silicate additive liquid or silicate filter to protect certain gasket materials				
										*** Mixing different types of antifreeze can reduce their corrosion protection. Engine manufacturers recommend a 10% limit on mixing coolant types.				

This document was assembled in an effort to help explain the use of OAT coolant technology in the Cummins ISL engine.

Page 1: Explains the different coolants and their definitions currently available on the market.

Page 2: This page is based on my research on the available Cummins documents and has led me to this determination: The HEAVY DUTY engines are those engines which have a total cylinder capacity of 10 Liters or more (Metric) or a minimum of 610.237 Cu. Ins. (SAE) Society of Automotive Engineers.

NONE of the Cummins ISL, ISC or ISB engines meet the minimum cylinder capacity criteria to be placed in the HEAVY DUTY ENGINE category. The ISL does meet the criteria for a MID-RANGE ENGINE.

Page 3: Complete coolant matrix formatted on one single 8.5" x 14" page. This page can be printed as a legal size document OR as a letter size document.

IN CONCLUSION: Shell Rotella Extended Life Coolant (ELC) and its three COMPATIBLE coolants can be used in the Powerglide chassis' ISL engine and meet both Cummins Engineering Standards (CES 14603) and the OEM (Tiffin Motorhomes) Chassis Specifications, **WITHOUT** the need to add special silicate additive liquid or a silicate filter.

The four COMPATIBLE COOLANTS are listed below:

Shell Rotella® Extended Life Coolant

CAT® Extended Life Coolant

Chevron Texaco Delo™ Extended Life Coolant

Texaco Havoline™ Extended Life Coolant

There may be more compatible coolants these four are all I've found at this time.