CITGARD Heavy Duty Engine Oils: Our New PC-12 Lineup

The webinar will begin in less than 10 minutes.



Mystik LUBRICANTS

CITGO LUBRICANTS

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CITGARD Heavy Duty Engine Oils: Our New PC-12 Lineup

The webinar will begin in less than 5 minutes.



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TEST YOUR KNOWLEDGE

Which of the following factors primarily influences oil drain intervals in heavy-duty trucks?

- Engine Type and Operating Conditions
- Tire Size and Brake Type
- Truck Color and Driver Experience
- Fuel Type Only



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TEST YOUR KNOWLEDGE

CITGARD 700 Synthetic Blend 10W-30 engine oil helps extend oil drain intervals by providing enhanced wear protection and increased oxidation resistance.

True

False



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TEST YOUR KNOWLEDGE

Why is cylinder wall honing important?

Helps Create the Perfect Engine Sound

Helps Retain Engine Oil in the Cylinder Wall to Lubricate the Piston Rings

It's Not Important

Creates Friction Energy That is Used to Charge Batteries



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CITGARD Heavy Duty Engine Oils:
Our New PC-12 Lineup



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Amber Fessler - NLGI CLGS; STLE CLS & OMA-I

- CITGO Senior Sector Manager
- Materials Engineer
- 14 Years of Experience in Lubricants
- STLE Certified
  - Certified Lubrication Specialist
  - Oil Monitoring Analyst I
- NLGI Certified
  - Certified Lubricating Grease Specialist



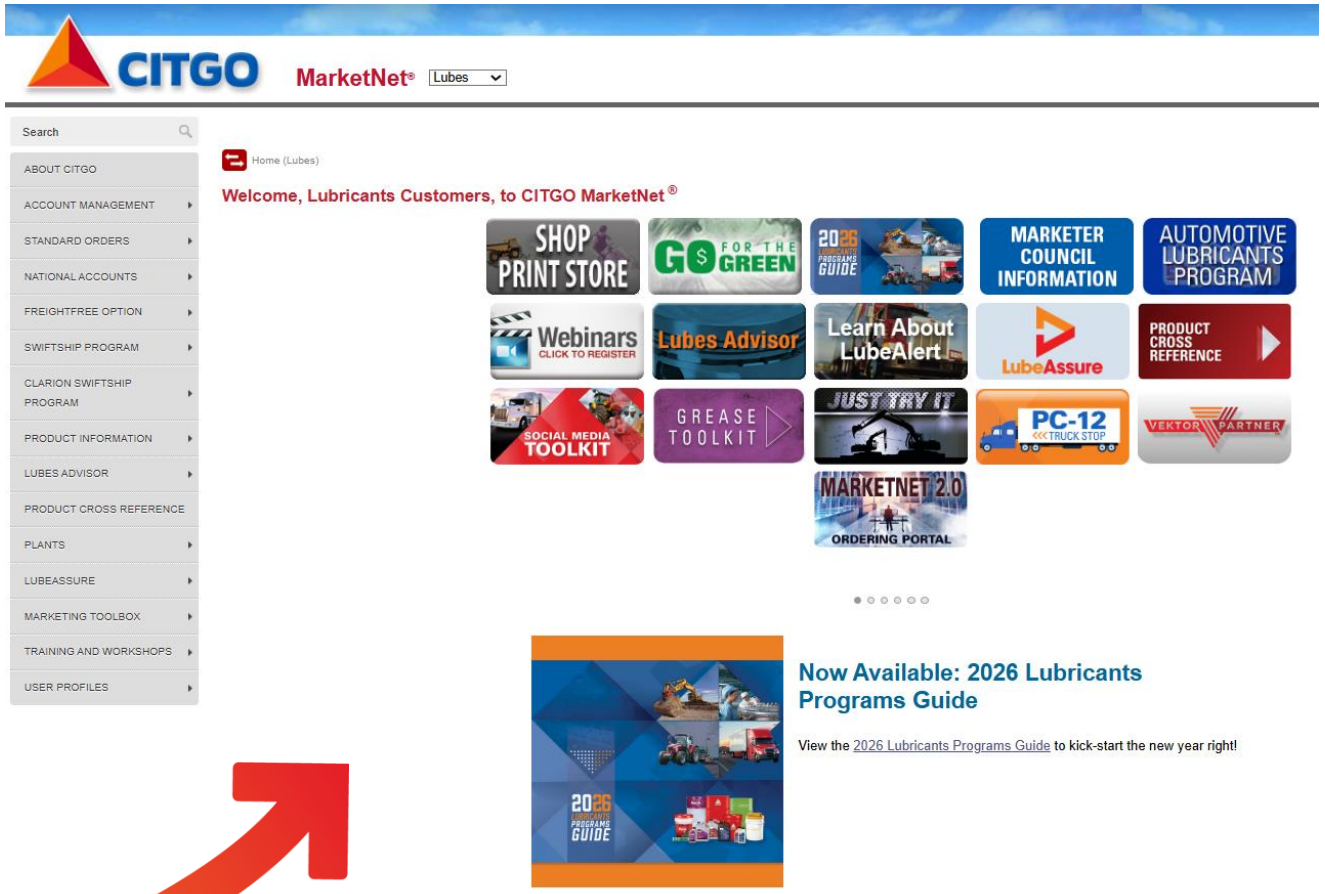
Want Resources?

2026 Programs Guide

Support Literature

Social Media Toolkit

Webinars



Future Webinars & Tech Talks

December 7: Tech Talk: Grease



Steven Bowles – STLE CLS & OMA-I

- CITGO Sr. Product Specialist
- B.S. Zoology & M.S. Environmental Science
- 22 Years of Experience in Lubricants
- 16 Years of Experience in Laboratory Supervision/Analytical Chemistry



Franco Gangeri

- CITGO Product Manager
  - Heavy Duty
- 21 Years of Experience in Lubricants
  - B2B Key Accounts & Global Accounts
  - International Business Manager
  - Head of National Accounts
  - HDEO Business Development Manager
  - Regional Sales Director



Agenda

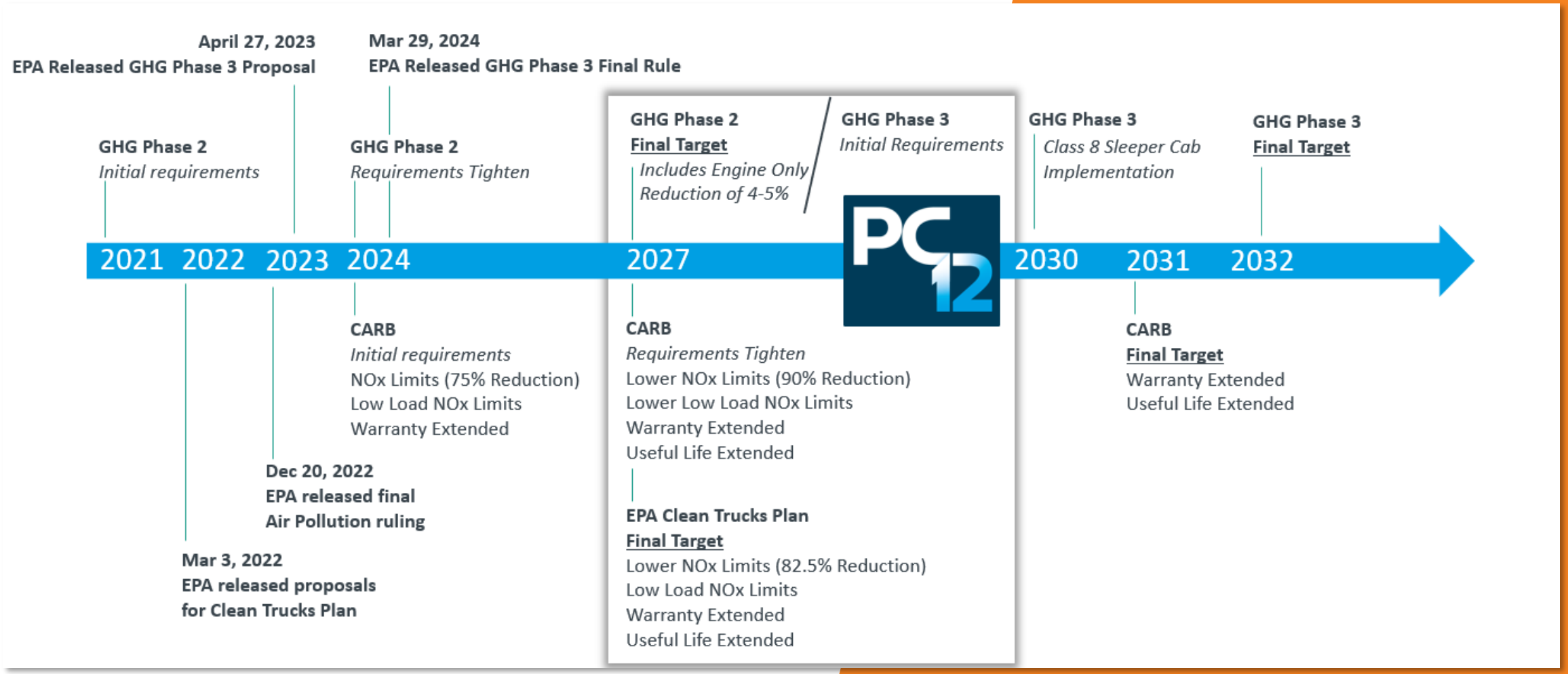
1. PC-11 Category
2. Upcoming PC-12 Category & Changes Involved
3. New CITGARD & Mystik Lineups

HD Specifications

Regulation Leads to Specifications

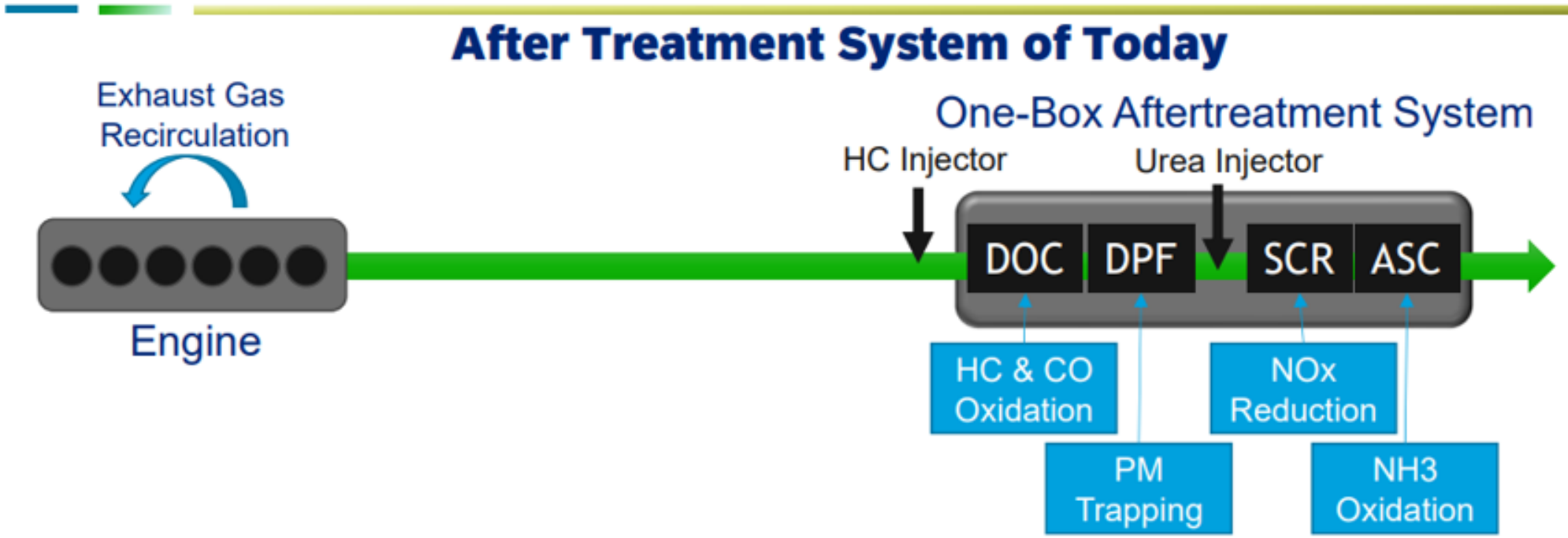
	Emissions Regulation			Specification	Status
Year Phased In	Particulate Emissions (g/bhp-hr)	NOx Emissions (g/bhp-hr)	CO_2 Emissions		
1988	0.60	10.7		1985 - API CE	Obsolete
1990-91	0.25	6.0 -> 5.0		1990 - API CF-4	Obsolete
1994	0.10	5.0		1995 - API CG-4	Obsolete
1998	0.10	4.0		1998 - API CH-4	Active
2002	0.10	2.0		2002 - API CI-4/CI-4 PLUS	Active
2007, 2010	0.01	1.2 -> 0.2		2006 - API CJ-4	Active
2014-2018			GHG Phase 1	2016 - API CK-4 / API FA-4	Active (PC-11)
2021-2027			GHG Phase 2	2027 - New API Categories Have Been Requested (PC-12)	Under Development (PC-12)
2024-2031	0.005	CARB (0.05 - 0.02)			
2027	0.005	EPA (0.035)			
2027-2032			GHG Phase 3		

HD Specifications



HD Specifications

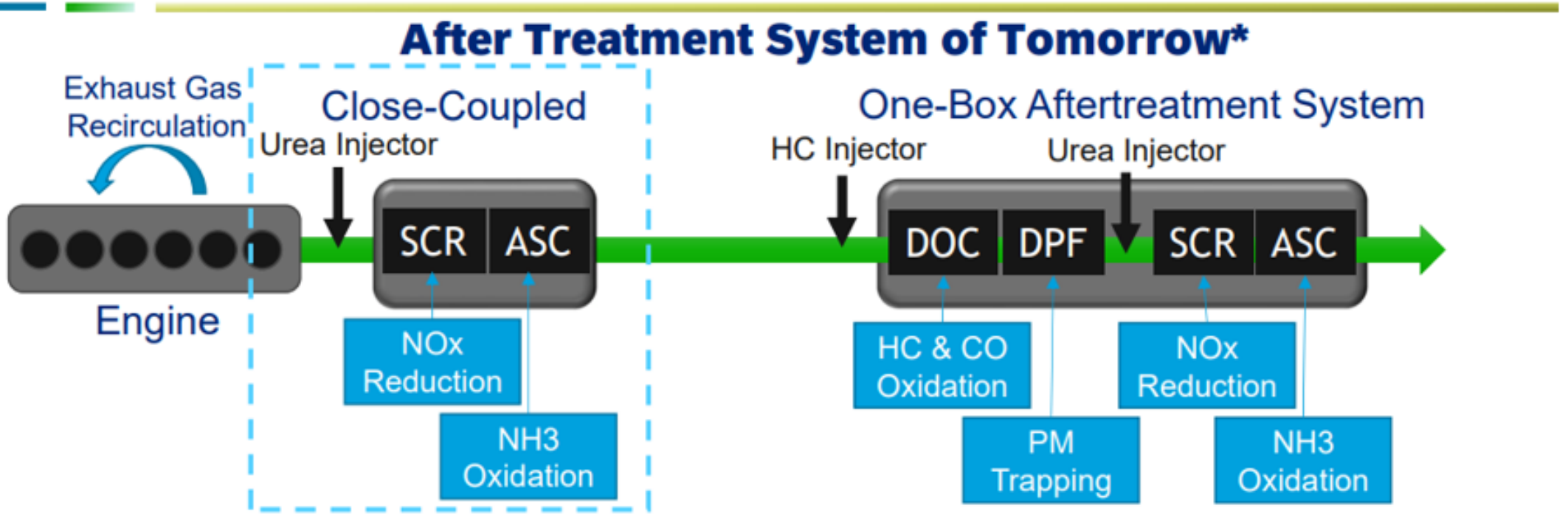
More complex aftertreatment systems are required



DOC – Diesel Oxidation Catalyst
DPF – Diesel Particulate Filter
DEF – Diesel Exhaust Fluid (Urea)
SCR – Select Catalytic Reduction
ASC – Ammonia “Slip” Catalyst

HD Specifications

More complex aftertreatment systems are required



DOC – Diesel Oxidation Catalyst
DPF – Diesel Particulate Filter
DEF – Diesel Exhaust Fluid (Urea)
SCR – Select Catalytic Reduction
ASC – Ammonia "Slip" Catalyst

*Based on possible solution for Class 8 Truck proposed by CARB/EPA research

HD Specifications

Longer warranties and useful life for engines and aftertreatment systems

Warranty periods and useful life periods for heavy-duty engines						
	Warranty period			Aftertreatment system useful life periods		
	Miles	Years	Hours	Miles	Years	Hours
Current	100,000	5	–	435,000	10	22,000
MY 2027 and later	450,000	10	22,000	650,000	11	32,000

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PC-11

API CK-4 & FA-4: Why Two API Oil Categories?

API CK-4

More Robust API CJ-4
Recommended by all OEMs
Full backward compatibility

SAE xW-30 and xW-40
HTHSV > 3.5 mPa•s
API CK-4, ACEA E

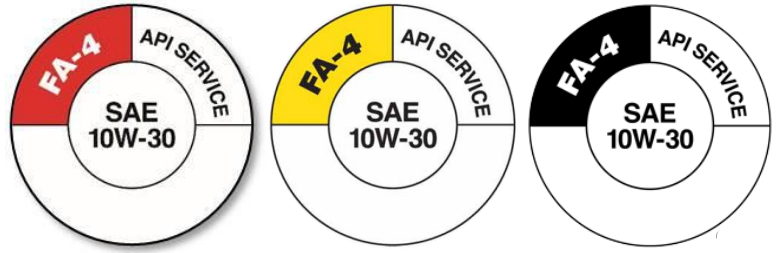
API FA-4

Robust CJ-4 at lower viscosity
Some OEM's opted out
Not backward serviceable

SAE xW-30
HTHSV: 2.9 – 3.2 mPa•s
API FA-4, New ACEA F

API CK-4 has the same durability requirements as API FA-4 to minimize risks associated with the new lower viscosity fuel economy grades







PC-12 – Category Proposal

	2023		2024		2025		2026		2027
	1H	2H	1H	2H	1H	2H	1H	2H	1H
INDUSTRY	NCDT				Tech Demo + Limit Setting		Mandatory Waiting Period		First Allowable Use January 1, 2027

PC-12 Timeline

Key PC-12 **Changes**

Additional wear performance

(Detroit Diesel DD13 Scuffing Test)

Improved Oxidation Performance

(Tighter limits in Volvo T-13)

Replacement of tests approaching their end-of-life

(Mack T-11, Mack T-12)

New Seals Compatibility Testing

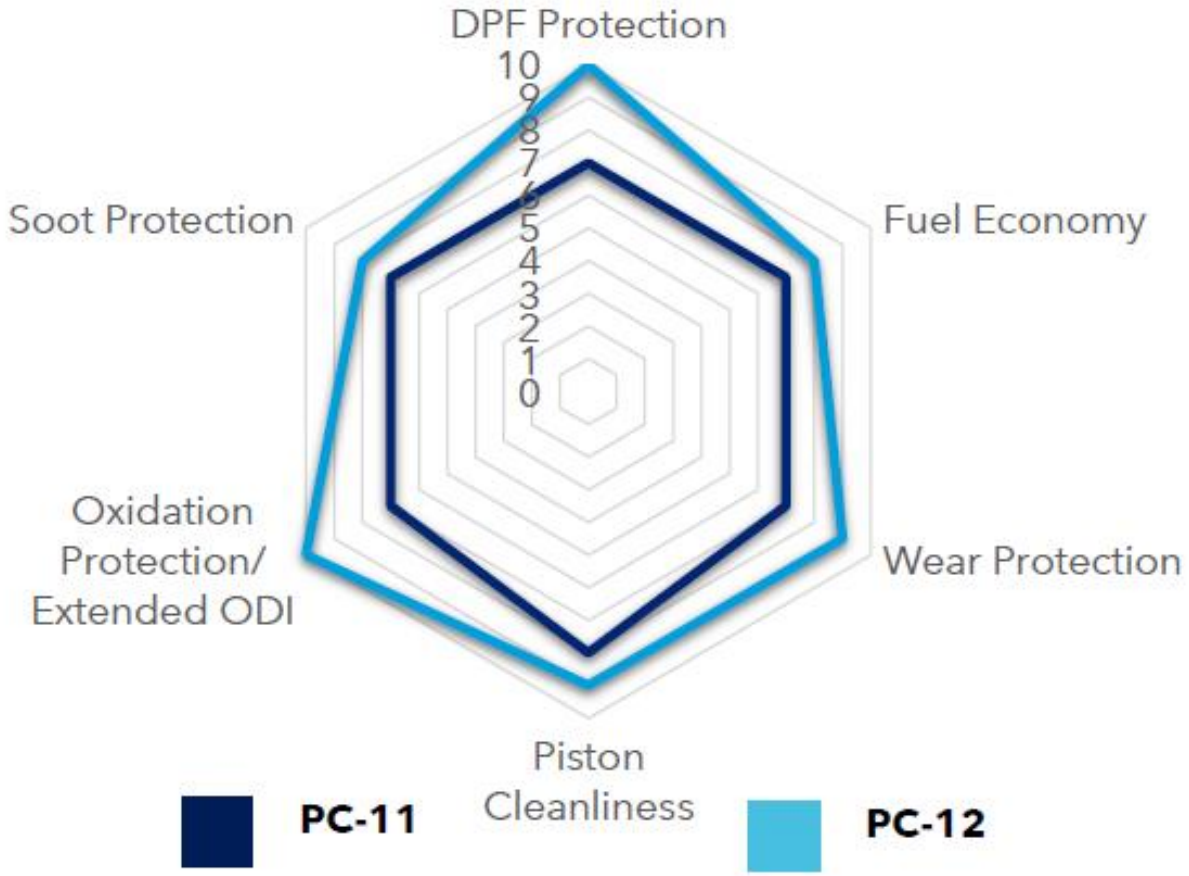
(Addition of HNBR Seal)

Reduction in Chemical Limits to protect after-treatment systems

(Target Limits of 0.08% max P, 0.3% max S, 0.9% max SASH)*

Inclusion of XW-20 viscosity grades

PC-12 Technical Improvements



HD Specifications

Expected Category OEM Specifications for PC-12

OEM	Specification	Chemical Limits
Cummins	Updated “C” Category (CES 20112)	0.08% max P 0.3% max S 0.9% max SASH
	Updated “F” Category (CES 20113)	
Detroit Diesel Corporation	Market General CL-4 (DFS 93K232)	0.08% max P 0.3% max S 0.9% max SASH Na/K max spec
	Market General FB-4 (DFS 93K233)	
	Extended ODI CL-4 Premium (DFS 93K234)	0.08% max P 0.3% max S 0.9% max SASH Na/K max spec
	Extended ODI FB-4 (DFS 93K235)	
Volvo	VDS-4.5 for “C” Category Oil (Not Upgrading for 2027)	0.12% max P 0.4% max S 1.0% max SASH
	VDS-5 Specification for “F” Category Oil	0.12% max P 0.3% max S 1.0% max SASH
Navistar	CL-4,FB-4	
PACCAR	CL-4, (FB-4 TBD)	
Ford	WSS M2C171-F1 (Not upgrading for 2027)	0.12% max P 0.4% max S 1.0% max SASH



CITGARD
PC-12 Portfolio

You don’t have to choose between wear protection, fuel economy or DPF life

	CL-4	FB-4	Multi-Fuel Capable	
CITGARD 1000 MFE 5W-30		✓		VDS 5
CITGARD 1000 5W-40	✓			
CITGARD 700 MFE 10W-30		✓		
CITGARD 700 10W-30	✓		✓	Ford
CITGARD 700 15W-40	✓		✓	Ford
CITGARD 600 10W-30	✓			
CITGARD 600 15W-40	✓			



*Specifications and products are still in progress so may be subject to change prior to launch.

CITGO CITGARD 800

Synthetic Blend Engine Oil

- Specially formulated for natural gas (CNG/LNG), diesel and gasoline fueled engines
- Available in SAE 15W-40 and 10W-30 viscosity grades
- **It will be phased out for 2027**
- The new PC-12 CITGARD 700 will have Multi-Fuel Capabilities







CITGO CITGARD 600

Single-Viscosity Engine Oils

- CITGO CITGARD 600 Single-Viscosity Engine Oils Monograde are high quality, heavy-duty crankcase oils
- Available SAE 10W, 30, 40, and 50 viscosity
- **They will remain in the CITGO portfolio with no changes in the formulation**



CITGO CITGARD 1000

Full Synthetic Engine Oils





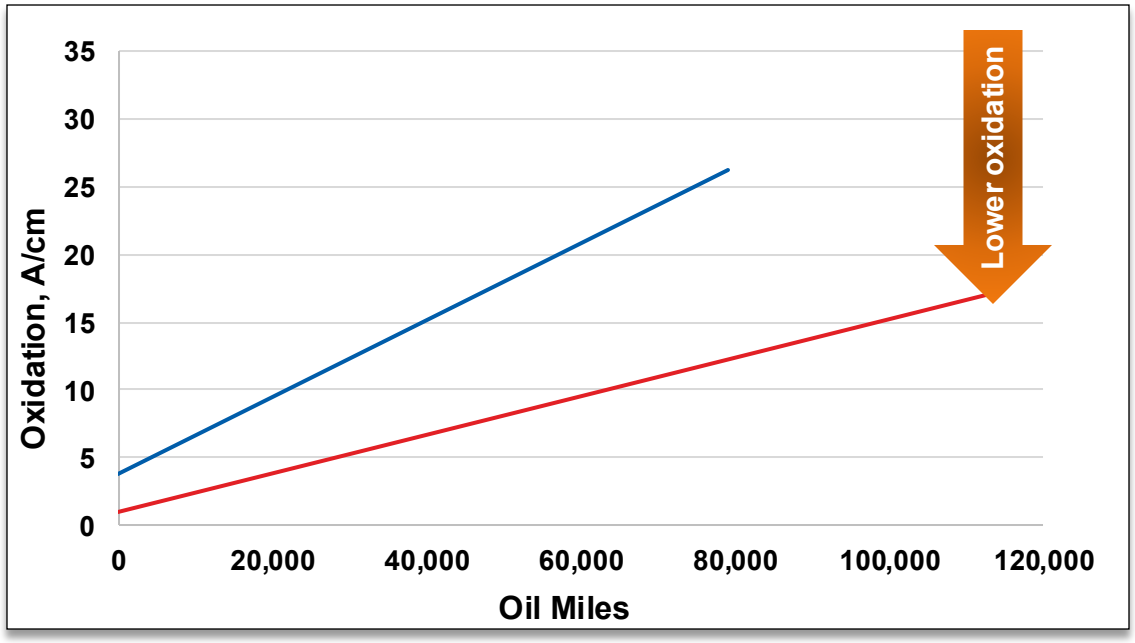
- Advanced fuel efficiency formula delivers maximum fuel economy, extreme cold temperature performance, and superior engine durability
- **For first time CITGO CITGARD 1000 Full Synthetic Engine Oils will have a F-Category family**

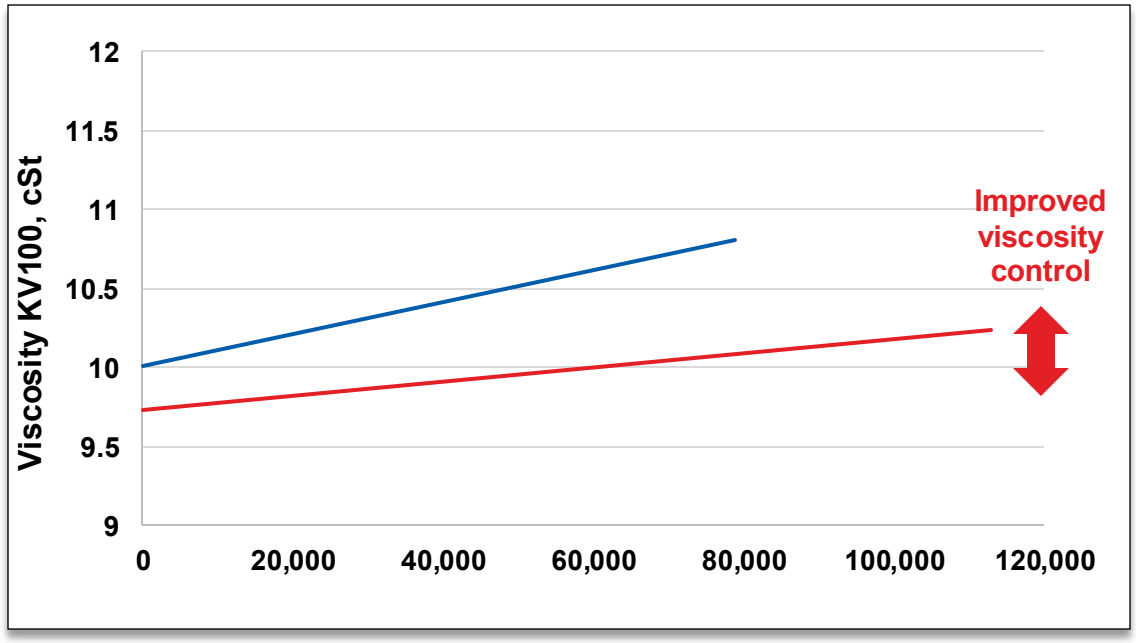
PC-11		PC-12
5W-40 API CK-4	→	**5W-40 API CL-4**
5W-30 API CK-4		**5W-30 API FB-4**

CITGARD 700 Keeps Trucks on the Road

Improved oxidation performance of CITGARD PC-12 technology helps prevent oil breakdown beyond standard ODIs, delivering reliable field durability.

Robust oxidation protection and viscosity control ensure sustained oil health and viscosity grade retention for >100K miles.



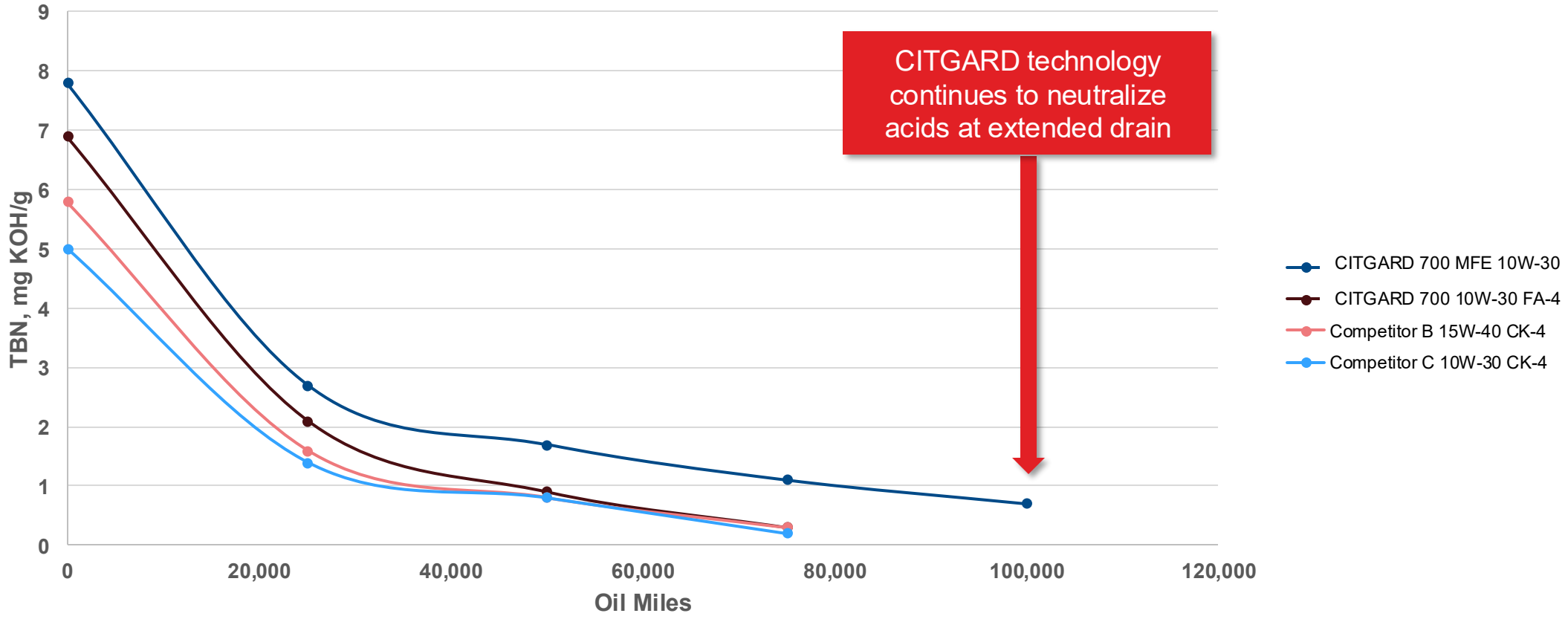


CITGARD 700 MFE 10W-30 PC-12
CITGARD 700 MFE 10W-30 PC-11

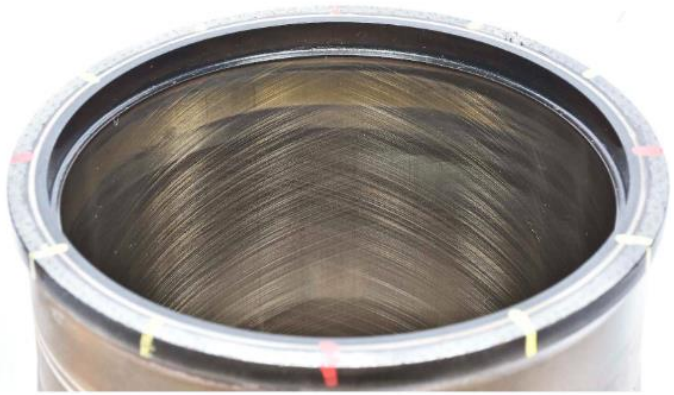
Source: *Cummins X15 Field Trial*

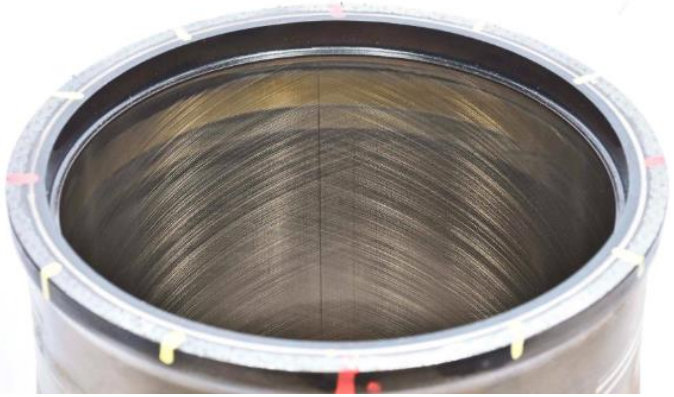
CITGARD 700 Oil Drain Extensions

CITGARD 700 MFE 10W-30 (FB-4) has industry-leading TBN retention
even at reduced Phos. levels



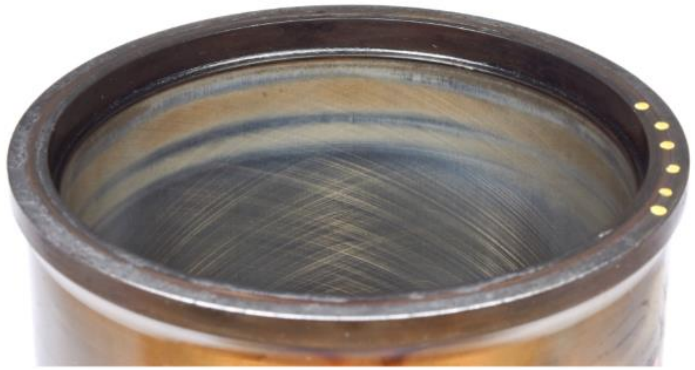
CITGARD PC-12 Protects Against Cylinder Wear even at 800 Phos





CITGARD 700 MFE (FB-4) 10W-30 = 4.12 µm
100K mile ODI





Competitor CK-4 10W-30”F” = 19.68 µm
85K mile ODI

CITGARD Ford 6.7 L Field Trial

Advanced performance at lower HTHS and Phos demonstrates improved bearing wear protection compared to Ford-approved CK-4 technology

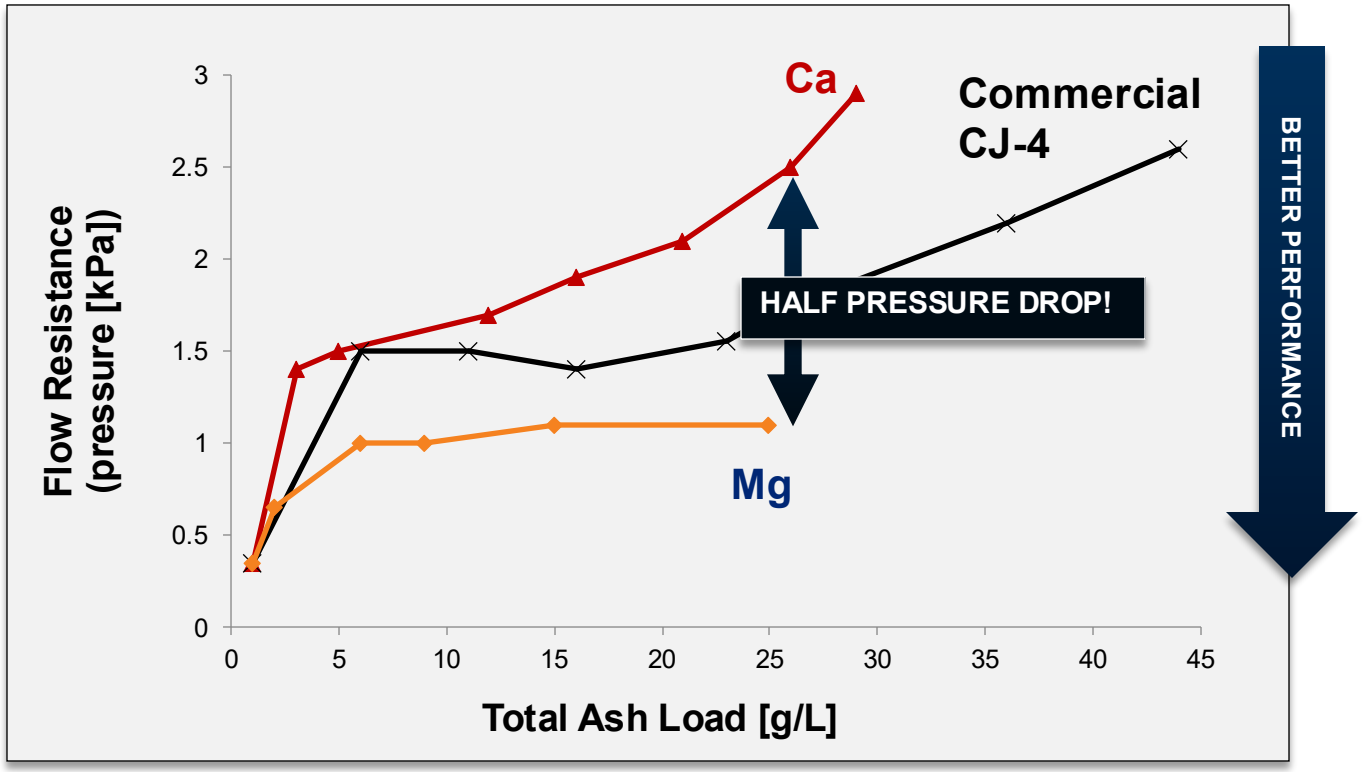


CITGARD 700 MFE (FB-4)
10W-30 800ppm Phos



CK-4 10W-30
1100ppm Phos

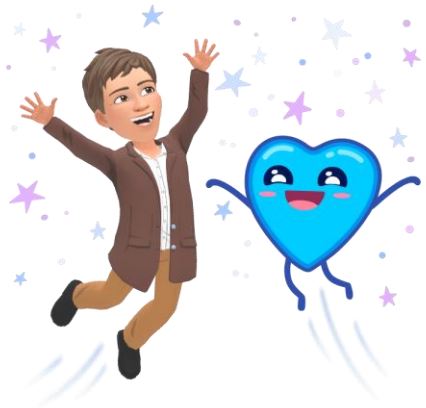
CITGARD 700 DPF Protection





Source: *ICES2012-81237*

Reduced Resistance: Less dense and more porous Mg detergent in CITGARD products reduce resistance on DPFs



CITGARD products' Ca/Mg mixed detergent system reduces DPF harm, extending the life and effectiveness of after-treatment systems

DPF Protection for Improved Fuel Economy and Savings

DPF REGENERATION CAN BE ACHIEVED IN TWO WAYS:

- ***PASSIVE:*** *Under normal operating conditions the DPF becomes hot enough to burn off the soot*
- ***ACTIVE:*** *At a certain level of soot, the engine control unit alters operating conditions to increase the temperature in the DPF to burn off the soot*

- Active regenerations require fuel to be injected into the exhaust system to burn off soot which consumes fuel
- More backpressure/ash load, the more regens required, and more fuel consumed for a process other than combustion
- **Mg** ash has **less impact on DPF flow rate** as shown previously
- CITGARD leverages the **Ca/Mg ratio** to achieve less DPF regeneration, leading to **enhanced fuel economy benefits**

Technology Grade	Major Brand API FA-4 10W-30	CITGARD MFE (FA-4) 10W-30
ppm Ca	2028	1044
ppm Mg	100	1000
ppm P	964	1152
Miles/Regen	913	3153
Overall MPG	6.9	7.2

Fuel savings (USD)
$18,000

Mystik

PC-12 Portfolio

	CL-4	CI-4 +	Multi-Fuel Capable	
Mystik JT-8 Synthetic SHD 10W-30	✓		✓	
Mystik JT-8 Synthetic SHD 15W-40	✓		✓	
Mystik JT-8 Synthetic Blend SHD 10W-30	✓		✓	Ford
Mystik JT-8 Synthetic Blend SHD 15W-40	✓		✓	Ford
Mystik JT-8 Synthetic Blend SHD 15W-50		✓		
Mystik JT-8 Heavy Duty 15W-40	✓			

Made to make it last



*Specifications and products are still in progress so may be subject to change prior to launch.

Final Thoughts

1. PC-12 supports 2027 engine technology
2. CL-4 and FB-4 replace today’s CK-4 and FA-4 categories
3. Final OEM specifications still to be issued
4. Need OEM guidance on where to use FB-4
5. Preparation today ensures a smooth transition for customers, fleets, and distributors

Questions?



Please post your questions using the Q&A function.



For technical inquiries or issues:
Lubes Answer Line 800-248-4684
lubeshelp@citgo.com



Thank You!

See you next time

