



November 2016

DELO[®] 400 HEAVY-DUTY ENGINE OIL

Product Offering, Application and Competitive Comparison



ISOSYN
ADVANCED
TECHNOLOGY™

Delo[®]
Let's go further.®



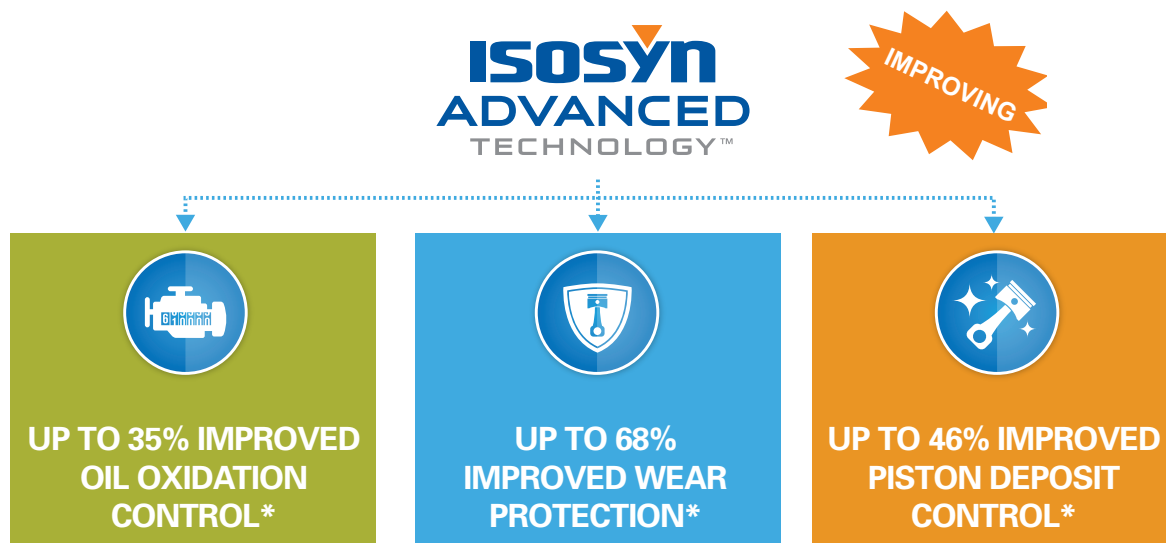
DELO® HEAVY-DUTY ENGINE OIL DELIVERS

Delo Heavy-Duty Engine Oil with ISOSYN® Advanced Technology

Delo® with innovative ISOSYN® Advanced Technology is here. Delivering industry leading durability, reliability and efficiency. It works in synergy with the changing conditions in your engine to maximize protection, optimize performance and extend oil life.

ISOSYN ADVANCED TECHNOLOGY

What is it? The combination of Chevron's outstanding formulation expertise, unique high performance additive chemistry and premium base oils helps extend the durability of critical diesel engine parts.



**As compared to previous generation Chevron HDMO formulations*

Improved durability, reliability and efficiency: Delo 400 products formulated with ISOSYN Advanced Technology can provide improved engine longevity, extended oil drain performance, and excellent diesel component parts protection, helping to extend vehicle life and minimize the total cost of ownership when compared with previous generation Chevron HDMO formulations.

In addition, Delo 400 low viscosity oils formulated with ISOSYN Advanced Technology will help optimize fuel efficiency performance and total cost savings.



LARGEST FIELD TEST PROGRAM IN CHEVRON HISTORY

Chevron's new API CK-4 and API FA-4 formulations have been undergoing the most rigorous field testing since 2013.

Delo 400 API CK-4 and API FA-4 products have been field tested in more than 900 engines, with different OEM engines and equipment in a variety of operating conditions.

On-Road

645

Tractor Trailers, Cement Mixers Waste Trucks and Diesel Pick-up Trucks

Off-Road

255

Tractors, Wheel Loaders, Bulldozers, Haul Trucks and Excavators

Marine / Oil & Gas

52

Inland Marine, Fracking and Drilling Rig Engines



Delo 400 ZFA SAE 10W-30 Latest teardown results

Customer: Boaty's Transport

Operation: Over the road Refrigeration Hauler

Equipment: Kenworth T680 truck

Engine: PACCAR MX-13

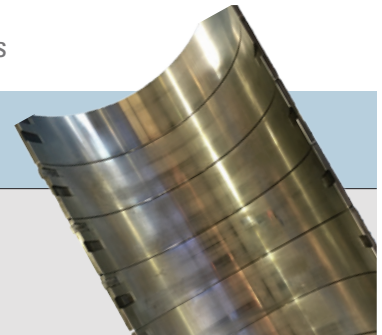
Total Engine Miles: 530,000+

Oil Drain Interval: 40,000 miles



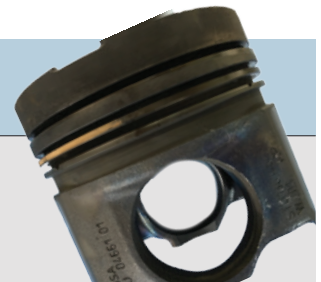
Main Bearings

Bearings are in fantastic condition with no visible overlay removal



Pistons

Pistons are very clean with no visible deposit buildup on the crown or lands area















































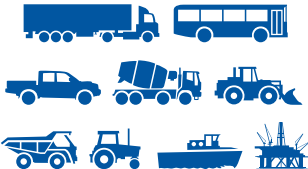



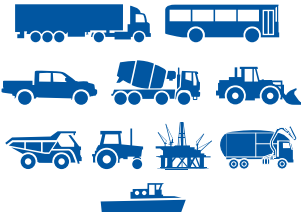
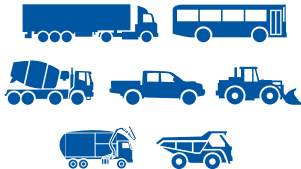
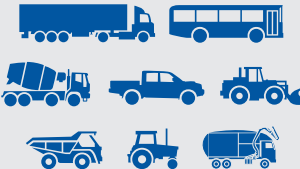
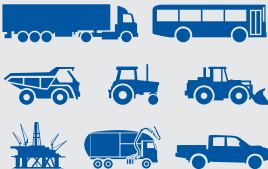

When extending oil drains, always follow OEM recommendations and utilize used oil analysis.



Delo®
Let's go further.®

CHEVRON DELO® HEAVY-DUTY ENGINE OIL PRODUCT LINE

Benefits / Application / Performance

	HIGH PERFORMANCE SYNTHETICS			EXCEPTIONAL SYNBLEND PROTECTION			COVENTIONAL DURABILITY		
PRODUCT	Delo 400 XSP	Delo 400 XSP	Delo 400 SP	Delo 400 ZFA	Delo 400 XLE	Delo 400 XLE	Delo 400 SDE	Delo 400 LE	Delo 400 NG
IMAGE									
VISCOSITY GRADE / API LEVEL	SAE 5W-40 / API CK-4/SN	SAE 5W-30 / API CK-4/SN	SAE 0W-30	SAE 10W-30 / API FA-4/SN	SAE 15W-40 / API CK-4/SN	SAE 10W-30 / API CK-4/SN	SAE 15W-40 / API CK-4/SN	SAE 15W-40 / API CJ-4/SM	SAE 15W-40 / NATURAL GAS CNG/LNG
PRODUCT BENEFITS	<div><div></div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div><div></div><div></div><div></div></div>	<div><div></div><div></div><div></div><div></div></div>	<ul style="list-style-type: none">• ISOSYN Technology• API CJ-4 for low emission engines• Delo 400 LE SAE 15W-40 has a wide range of approvals and older OEM specifications• Proven performance in wide range of on and off-road engines	<ul style="list-style-type: none">• ISOSYN Technology• Heavy-Duty CNG/LNG Performance• Extended drain capable for newer CNG engines• Cummins CES 20085 approved for CNG/LNG performance
VEHICLE / EQUIPMENT APPLICATION									
PERFORMANCE CAPABILITIES	<ul style="list-style-type: none">✓ Cold weather startup✓ High temperature protection✓ Excellent wear protection✓ Delo Warranty Plus Protection	<ul style="list-style-type: none">✓ Up to 40% improved low temperature cranking viscosity*✓ Up to 2% improved fuel efficiency**✓ Up to 50% longer drain intervals versus API CJ-4 15W-40***✓ Delo Warranty Plus Protection	<ul style="list-style-type: none">✓ Up to 50% improved low temperature cranking viscosity*✓ Fuel efficiency benefits✓ Engine durability protection✓ Delo Warranty Plus Protection	<ul style="list-style-type: none">✓ Up to 20% improved fuel efficiency versus API CJ-4 SAE 10W-30*✓ Up to 32% better wear protection versus API CJ-4**✓ Helps minimize operating costs✓ Delo Warranty Plus Protection	<ul style="list-style-type: none">✓ Up to 35% longer oil life*✓ Up to 68% better wear protection**✓ Up to 33% reduction in piston deposits***✓ Delo Warranty Plus Protection	<ul style="list-style-type: none">✓ Up to 28% longer drain intervals versus API CJ-4*✓ Up to 25% improved low temperature cranking viscosity**✓ Up to 1% improved fuel efficiency***✓ Delo Warranty Plus Protection	<ul style="list-style-type: none">✓ Up to 50% better wear protection versus API CJ-4*✓ Up to 60% improved diesel power cylinder durability versus API CJ-4**✓ Up to 20% increase in total diesel engine life to rebuild***✓ Delo Warranty Plus Protection	<ul style="list-style-type: none">✓ Provides Extended Service Protection✓ Maximizes Engine Life✓ Minimizes Operating Costs✓ Excellent emission control system life✓ Delo Warranty Plus Protection	<ul style="list-style-type: none">✓ Excellent nitration and oil oxidation control✓ Extended drain capable in CNG/LNG HD engines✓ Provides excellent engine cleanliness✓ Delo Warranty Plus Protection
PERFORMANCE DETAILS		<p>*Based on SAE J300 low temperature cranking viscosity versus SAE 15W-40</p> <p>**Based on Volvo D12D engine test stand compared to API CJ-4 SAE 15W-40</p> <p>***Based on field test performance to date in Detroit Diesel DD15 engines versus API CJ-4 market general SAE 15W-40 product</p>	<p>*Based on SAE J300 Low temperature cranking viscosity versus SAE 15W-40</p>	<p>*Based on Volvo D12D engine test stand comparison to API CJ-4 SAE 10W-30</p> <p>**Based on results from Cummins ISB Average Cam Lobe wear compared to maximum wear level for API CJ-4</p>	<p>*Based on oxidation results from Volvo T-13 test and comparison to maximum oxidation peak height maximum</p> <p>**Based on Mack T-12 top ring mass loss measurement versus API CJ-4 passing requirement</p> <p>***Based on Daimler OM501LA piston deposit merit results for this formulation versus MB228.31 minimum pass requirements for previous generation of heavy duty engine oils</p>	<p>*Based on results from Volvo field testing program compared to maximum drain interval for Volvo D13 engines for VDS-4 Products</p> <p>**Based on SAE J300 Low temperature cranking viscosity versus SAE 15W-40</p> <p>***Based on Volvo D12D engine test stand comparison to SAE 15W-40</p>	<p>*Based on results from Cummins ISM Crosshead Weight Loss, mg compared to API CJ-4 maximum engine testing wear level requirement</p> <p>**Based on results from Cat C-13 end of test iron wear measurement versus maximum iron wear level of 200ppm</p> <p>***20% increase in total engine life to rebuild based versus OEM B 50 engine life to rebuild HD diesel engines and Delo 400 SDE improved wear protection performance.</p>		



API CK-4 AND API FA-4 COMPETITIVE COMPARISON

	SYNTHETICS		SYNTHETIC BLENDS			PREMIUM CONVENTIONAL	MARKET GENERAL
API LEVEL	API CK-4	API CK-4	API FA-4	API CK-4	API CK-4	API CK-4	API CK-4
<div></div>	<div>Delo® 400 XSP</div> <div></div> <div>SAE 5W-30</div>	<div>Delo 400 XSP</div> <div></div> <div>SAE 5W-40</div>	<div>Delo 400 ZFA</div> <div></div> <div>SAE 10W-30</div>	<div>Delo 400 XLE</div> <div></div> <div>SAE 15W-40</div>	<div>Delo 400 XLE</div> <div></div> <div>SAE 10W-30</div>	<div>Delo 400 SDE</div> <div></div> <div>SAE 15W-40</div>	<div>Ursa Super Plus EC</div> <div></div> <div>SAE 15W-40 / 10W-30</div>
Shell	Rotella T6 Multi-Vehicle SAE 5W-30	Rotella T6 SAE 5W-40	Rotella T5 Ultra SAE 10W-30	Rotella T5 SAE 15W-40	Rotella T5 SAE 10W-30	Rotella T4 SAE 15W-40 / SAE 10W-30	Rotella T3 / T2 SAE 15W-40
Mobil	Mobil Delvac 1 ESP SAE 5W-30	Mobil Delvac 1 ESP SAE 5W-40	Mobil Delvac Extreme FE SAE 10W-30	Mobil Delvac Extreme SAE 15W-40 / SAE 10W-30	Mobil Delvac Extreme SAE 10W-30	Mobil Delvac 1300 Super SAE 15W-40 / SAE 10W-30	Mobil Fleet SAE 15W-40
Valvoline	No Product	Premium Blue Extreme SAE 5W-40	No Announced Product	Premium Blue 8600 ES SAE 15W-40	Premium Blue 8600 ES SAE 10W-30	All Fleet Plus E-900 SAE 15W-40 / SAE 10W-30	No Product
Petro-Canada	Duron UHP SAE 5W-30	Duron UHP SAE 5W-40	Duron Advanced SAE 10W-30	Duron SHP SAE 15W-40	Duron SHP SAE 10W-30	Duron HP SAE 15W-40	No Product
Phillips 66	Triton Euro / SHP Euro SAE 5W-30	Triton / SHP SAE 5W-40	Super-D FE / Guardol FE SAE 10W-30	Super-D XA / Guardol ECT SAE 15W-40	Super-D XA / Guardol ECT SAE 10W-30	Super-D EC / Fleet Supreme EC SAE 15W-40 / SAE 10W-30	No Product
Castrol	Elixion SAE 5W-30	No Product	Vecton Advanced SAE 10W-30	Vecton SAE 15W-40	Vecton SAE 10W-30	Tecton HD SAE 15W-40	No Product

Never use this cross-reference for making final Chevron HDMO product recommendations to customers. Always check OEM recommendations and customer operating conditions to provide the correct Chevron HDMO product. Competitors' products listed are not intended to represent equivalent performance to Chevron HDMO products.





SEGMENT AND PERFORMANCE BENEFIT ICON REFERENCE

SEGMENT LEGEND

ICON	SEGMENT
	On-Road
	Buses
	Cement
	Waste
	Light Duty Diesel
	Construction
	Mining
	Agriculture
	Oil & Gas
	Marine

PERFORMANCE BENEFIT ICONS LEGEND

ICON	PERFORMANCE BENEFIT
	Extreme Cold Pumpability
	Fuel Efficiency Benefits
	Maximum Engine Durability Protection
	Maximum Fuel Efficiency
	High Temperature Protection
	Engine Durability Protection
	Extended Oil Drain Protection
	Excellent Wear Protection
	Helps Minimize Operating Costs
	Cold Weather Start Up
	Clean Turbo Technology
	Clean Piston Technology



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