



# DELO<sup>®</sup> TORQFORCE<sup>®</sup> SYN FD-1 ISOCLEAN<sup>®</sup> CERTIFIED LUBRICANT

## PRODUCT DESCRIPTION

Delo<sup>®</sup> TorqForce<sup>®</sup> Syn FD-1 ISOCLEAN<sup>®</sup> Certified Lubricant is a premium, fully synthetic, multigrade, heavy-duty gear lubricant specifically designed for use in final drives and axles of modern Caterpillar off-road equipment operating in severe service, where fluids meeting the CAT FD-1 specification are recommended. The CAT FD-1 spec is designed to address extreme pressure (EP) or heavy load-carrying capability needed for final drive gear sets and bearings.



Chevron ISOCLEAN Certified Lubricants have been certified to meet specified ISO Cleanliness standards at point of delivery using industry leading filtration and testing technology. ISOCLEAN Certified products are the first step for contamination control and maximizing component life.

## CUSTOMER BENEFITS

Delo TorqForce Syn FD-1 ISOCLEAN Certified Lubricant delivers value through:

- **Ready to use** — Enables users to meet stringent original equipment manufacturers' cleanliness standards for fill lubricants.
- **Flexibility** — ISO Cleanliness targets can be customized to fit your business application needs.
- **Peace of mind** — Each delivery of Chevron ISOCLEAN Certified Lubricant includes an ISOCLEAN Certificate of Analysis.
- **OE fluid cleanliness requirements** — Customized to meet specific equipment manufacturers' fluid cleanliness requirements.

- **Maximizes equipment life in severe service** — Advanced additive system minimizes wear in heavily loaded gears and bearings by forming a strong protective layer on metal surfaces under extreme service conditions.
- **Prolongs oil life** — Extremely high thermal and oxidation stability protects against viscosity increase and deposit formation. Drain interval of 6,000 hours is recommended (4,000 hour drain for Delo TorqForce FD SAE 60).
- **Extreme temperature performance** — Excellent cold weather pumpability in sub-zero/ arctic operating conditions. Very good high operating temperature performance for severe service applications.
- **Minimizes unscheduled maintenance** — Effective rust and corrosion inhibitors protect final drive components. Good viscosity characteristics at low temperatures ensure rapid oil circulation on start-up, preventing premature component wear.
- **Excellent foam protection** — Works to avoid fluid loss due to foaming.
- **Better Low Temperature Performance** - Excellent cold flow properties help with rapid oil circulation to minimize wear during cold temperature starting.
- **Long equipment life** — Fluid film with special additives helps protect metal surfaces against pitting, scuffing and wear, even under severe operating conditions of high temperature and high load.
- **Warranty Plus protection** — Bumper-to-bumper warranty protection from the engine to the drive train. Payment for Chevron lubricant-related damage to your equipment, including parts and labor.<sup>1</sup>

<sup>1</sup> See Warranty Plus for details and restrictions.

Product(s) manufactured in the USA.

Always confirm that the product selected is consistent with the original equipment manufacturer's recommendation for the equipment operating conditions and customer's maintenance practices.

A **Chevron** company product

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## FEATURES

Delo® TorqForce® Syn FD-1 ISOCLEAN® Certified Lubricant is designed *specifically* for heavy-duty final drives and axles in severe service. It exhibits significantly improved performance versus TO-4 fluids in the area of gear protection, resistance to macropitting, improved corrosion protection and foam stability.

For customers who have final drive applications where the fluid also lubricates oil-immersed brakes or clutches from a common sump system, please use Delo TorqForce SAE 50 (Caterpillar TO-4). Additionally, Chevron's Delo TorqForce Syn FD-1 ISOCLEAN Certified Lubricant should not be used in powershift transmissions since it doesn't contain key friction modifiers required for high friction materials found in these systems.

## APPLICATIONS

Delo TorqForce Syn FD-1 ISOCLEAN Certified Lubricant is formulated for use in CAT off-highway trucks and D11R carry dozer front wheels, differentials and final drive where gear and bearing loads and temperatures are high. It is not suitable where a common sump is used for lubricating final drive gears, and immersed brakes or clutches.

Delo TorqForce Syn FD-1 ISOCLEAN Certified Lubricant meets or exceeds the **Caterpillar** FD-1 specification.

Consult with your Chevron Lubricant Representative or Chevron ISOCLEAN Certified Lubricants Marketer to set specific ISO Cleanliness targets for your business application.

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**TYPICAL TEST DATA**

	<b>Test Method</b>	<b>Multigrade</b>
<i>Product Number</i>		<i>278103</i>
<i>SDS Number</i>		<i>54934</i>
Density at 15 °C, kg/L	ASTM D4052	0.8447
API Gravity	ASTM D4052	33.0
Viscosity, Kinematic cSt at 40°C cSt at 100°C	ASTM D445	274 31
Viscosity Index	ADTM D2270	152
Viscosity, HTHS cP, 150°C	ASTM D4683	8.77
Viscosity, Brookfield cP, -10°C(14°F)	ASTM D2983	8,520
Viscosity, Brookfield cP, -20°C(-4°F)	ASTM D2983	24,000
Viscosity, Brookfield cP, -30°C(-22°F)	ASTM D2983	92,200
Viscosity, MRV cP, -30°C(-22°F)	ASTM D4684	82,752
Flash Point, COC, °C(°F)	ASTM D92	254(489)
Pour Point, °C(°F)	ASTM D97	-48(-54)
Copper Corrosion 3 hours, 100°C (212°F)	ASTM D130	1a
Foam Test, Sequence I Tendency/Stability, mL	ASTM D892	0/0
Foam Test, Sequence II Tendency/Stability, mL	ASTM D892	10/0
Foam Test, Sequence III Tendency/Stability, mL	ASTM D892	0/0
Phosphorus, mass %		0.031
Calcium, mass %		0.028

Minor variations in product typical test data are to be expected in normal manufacturing.

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