



# The New CITGO, Mystik, and Clarion Product Guides

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- 11 Years Experience in Lubricants
- STLE Certified
  - Certified Lubrication Specialist
  - Oil Monitoring Analyst I
- NLGI Certified
  - Certified Lubricating Grease Specialist



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- STLE Certified
  - Certified Lubrication Specialist
  - Oil Monitoring Analyst I
- NLGI Certified
  - Certified Lubricating Grease Specialist
- Active in STLE, NLGI, and ASTM



# Agenda

## Product Guide Layout

- Important Phone Numbers
- Quality Statement
- Table of Contents
- PI Sheets
- Reference Information
- Index

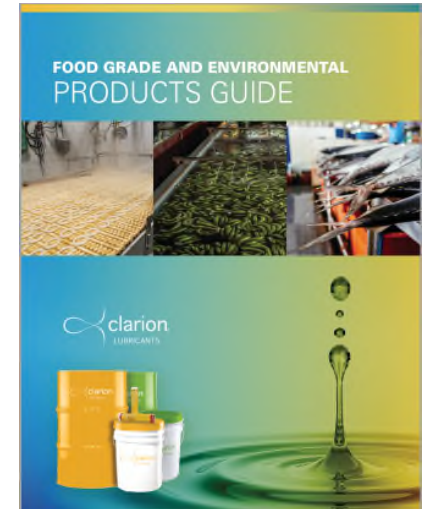
## Reference Information

- What is Included and How to Use the Reference Information

## PI Sheets

- Layout
- Content
- How to Read a PI Sheet

## How to Get the New Product Guides



# Product Guide Layout

Important Phone Numbers

Quality Statement

Table of Contents

PI Sheets

Reference Information

Index



## Product Guide Layout

- Important Phone Numbers
    - Product Answer Line – **800-248-4684**
    - Order Management – 800-331-4068, option 1
    - Customer Experience – 800-331-4068, option 2
  - Quality Statement and ISO 9001 Certifications
  - Table of Contents – Organized by Product Types
  - Product Information (PI) Sheets
  - Reference Information
  - Index – Alphabetical Listing of Products
-



## Table of Contents – CITGO Product Guide

- Engine Oils
    - PCMO – Passenger Car Motor Oils
    - HDEO – Heavy Duty Engine Oils
    - Small Engine Oils
  - Automotive Gear Oils
  - Transmission/Power Fluids
  - Industrial Fluids
  - Industrial Gear Oils
  - Metalworking Fluids
  - Industrial Gas Engine Oils
  - Railroad Lubricants
  - Functional Products
  - Compressor Lubricants
  - Process Oils
-



## How to Find a Product

- By Product Type – Look in the Table of Contents for the section covering the product type desired. Example: Industrial Gear Oils, then look for the specific product, e.g. CITGEAR Synthetic PAG Gear Fluids
  - By Product Name – Look in the Index for the product name, listed alphabetically – e.g. CITGEAR Synthetic PAG Gear Fluid
-



# Reference Information

What is Included and How to Use the Reference Information



## How to Use the Reference Information

- Information is provided for reference purposes
  - Product application charts are starting points for product recommendations
  - Technical Bulletins are for information and learning
-

## Reference Information – Engine and Gear Oils

- API Engine Oil Guide
    - Gasoline and Diesel Service Categories
    - ILSAC Standard for PCMO
  - HDEO product cross reference
    - Conventional, Synthetic Blend, Synthetic
  - SAE J300 Engine Oil Viscosity Grades
  - SAE J306 Automotive Gear Oil Viscosity Grades
  - Transmission Product Application Bulletin
-



## Reference Information – Industrial Oils

- Guide to Synthetic Industrial Lubricants
  - Compatibility of Common Elastomers and Plastics
  - Compressor OEM Fluid Cross Reference
  - Understanding the ISO 4406 Lubricant Cleanliness Rating System
  - Use of Fire Resistant Hydraulic Fluids
  - Water Glycols Compatibility
-



## Reference Information - Viscosity

- Comparative Viscosity Classifications
    - ISO, AGMA
-



## Reference Information - Metalworking

- Product Application Guide – Water Miscible
    - CITCOOL, Trukut
  - Product Application Guide – Straight Oils
    - Autokut AS, IS, Tri-Purpose
  - Metal Removal Fluid Application Overview
  - Metals Machinability Ratings
-



## Reference Information – Industrial Gas Engine Oil

- Stationary Natural Gas Engine Oil Cross Reference
  - Natural Gas Compressor Lubricant Chart
  - Natural Gas Compression Application Chart
  - Pacemaker GEO Application Chart
  - US EPA Amendments to the NESHAP for Stationary RICE
-



## Reference Information - Miscellaneous

- CITGO Sensitive Products List
  - Lubricant Storage and Handling and Shelf Life Guidelines
  - How to Take a Sample
  - Taking a Sample From Bulk Tanks
  - Field & Operations Safety and Personal Protective Equipment
  - Marketer Packaging Guidelines and Lubricants Compatibility Chart
  - Who Moved my Grease Cross Reference Chart
  - Viscosity Grade Comparison Chart
-



## Reference Information – Greases – Mystik Guide

- Grease Characteristics Chart
- NLGI Grease Consistency Classifications\*
- ASTM D4950 Classification and Specifications for Automotive Service Fill Greases Description and Service Marks
  - GC-LB, GC, LB
- Grease Thickener Compatibility Chart\*

\*Also in the Clarion Guide

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# Product Information Sheets

Layout

Content

How to Read a PI Sheet

# Product Information Sheets


Overview – A short description of the product.

Features and Benefits – A qualitative overview of key performance benefits.


Applications – How the product is to be used, Industry and OEM approvals. Applications for which the product is recommended.

PRODUCT INFORMATION SHEET

**CITGO® CITGARD® 800 Synthetic Blend Heavy Duty Engine Oils**  
Formerly CITGO® CITGARD® CNG/LNG Engine Oils




**OVERVIEW**




- Specially formulated for natural gas (CNG/LNG), diesel, and gasoline fueled engines. Available in SAE 15W-40 and 10W-30 viscosity grades.
- Use CONVERGE Engine Oil Advantage to provide multi-fuel fleet with optimum performance capability without compromising overall performance.

**FEATURES & BENEFITS**



- Meet Cummins CES 20092.
- Excellent for fleets wanting one oil to reduce inventory in a mixed fleet with a variety of applications.
- Additive technology delivers superior oxidation and nitration protection combined with a shear-stable VI improver to maintain viscosity, ensuring wear protection in severe applications.
- This unique formulation provides superior engine deposit control, reducing the tendency for valve guttering due to higher combustion temperatures in CNG engines and oil oxidation in the higher operating temperatures of modern diesel engines.
- Field-tested up to 50,000 miles and 1000 hours with 'headroom' results that demonstrate protection against deposits, corrosion, and liner and tappet wear.
- Maintain TAN and TBN reserve for optimum protection when longer oil service life is needed.
- CONVERGE additive technology provides excellent cold-weather pumpability, foam protection, exceptional oxidation and nitration control, overall engine cleanliness, and reduced oil consumption.
- The SAE 10W-30 grade is designed to improve fuel economy and is licensed API SN service category. Gasoline-powered pickup trucks and similar vehicles can take advantage of this technology where this grade is recommended by the OEM.

**APPLICATIONS**



**CITGARD with CONVERGE Advantage delivers:**

- C – Clean engine and corrosion protection field-tested up to 50,000 miles and 1,000 hours.
- ODI – extra TBN/TAN reserve to neutralize acids
- O – Oxidation – 100% better than test limit extended to over 1,000 hours
- N – Nitration – low nitration with extended 1,000 hours ODI
- V – Viscosity shear stability
- E – Extendable ODI to standardize diesel/CNG service
- R – Reduce pressure drop in DPF and regeneration event frequency while also reducing engine wear and maintaining low iron wear out to 1000-hour ODI
- G – Guaranteed results or money back
- E – Eliminates the need for three different engine oils for a multi-fuel type fleet

**CITGO**  
Petroleum Corporation  
Houston, Texas

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1-800-331-4066  
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**Online at**  
[www.CITGOlubes.com](http://www.CITGOlubes.com)

Manufactured in USA


C 10128

# Product Information Sheets

Properties – The physical and chemical properties of the product.

CITGO LUBRICANTS
CITGO CITGARD 800 Synthetic Blend Heavy Duty Engine Oils

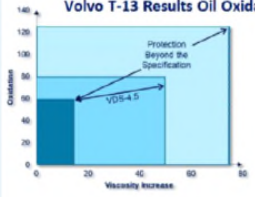
**APPLICATIONS**



Approved for:  
 Cummins CES 20092  
 Cummins CES 20086  
 Caterpillar ECF-3

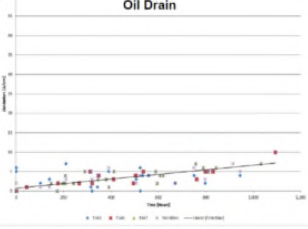
Detroit Diesel DFS 93K222  
 Volvo/Mack/Renault - VDS-4.5/EOS-4.5/RLD-3  
 API CK-4/SN

**Volvo T-13 Results Oil Oxidation**




100% Better oxidation protection than specification 20% below Volvo VDS-4.5 limit

**Oil Drain**



CITGO CITGARD 800 with Converge Technology. Field-tested to 1,000 hours with superior oxidation stability

**PROPERTIES**



**Typical Properties for CITGO CITGARD 800 Synthetic Blend Heavy Duty Engine Oils:**

SAE Grade	10W-30	15W-40
Material Code	632019	632020
Gravity, ASTM D4052, °API at 60°F	31.5	30.0
Pounds/Gallon at 60°F	7.3	7.3
Viscosity ASTM D445		
cSt at 40°C	86	124
cSt at 100°C	12.2	15.7
Viscosity Index	137	134
CCS Viscosity, cP, @ Temperature	6550 @ -25°C	5470 @ -20°C
MRV Viscosity, cP, @ Temperature	22500 @ -30°C	20000 @ -25°C
MRV Yield Stress, Pa, @ Temperature	<35 @ -30°C	<35 @ -25°C
Pour Point, °F (°C)	-42 (-44)	-39 (-38)
Flash Point, COC, °F (°C)	207 (405)	210 (410)
Noack Volatility, ASTM D5800, % Loss	11	10
Color, ASTM D1500	L4.0	L4.0
Total Base Number, ASTM D2896	10	10
Sulfated Ash, ASTM D874, % wt	0.9	0.9

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# Product Information Sheets

PRODUCT INFORMATION SHEET

**CITGO® HyDurance®  
AW Super NZ Fluid**

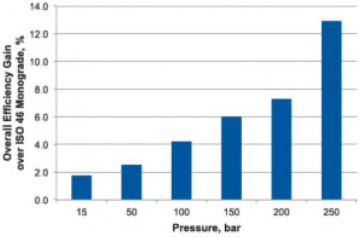


**OVERVIEW**

- A high-efficiency hydraulic fluid for use over a wide temperature use range.
- Formulated with premium base stocks and ashless additives to provide long fluid life and outstanding protection for demanding mobile equipment hydraulic systems.
- Zinc-free. Zinc compounds are regulated as priority pollutants under provisions of the Clean Water Act and SARA Title 313.

**FEATURES & BENEFITS**

- Multi-grade performance offers ISO 68 viscosity characteristics at high operating temperatures and ISO 32 viscosity characteristics at low operating temperatures.
- Helps increase pump efficiency for improved productivity.
- Zinc-free and non-toxic in acute aquatic toxicity test (LC-50) per OECD TG 203 limit test, for less environmental impact.
- Multi-grade performance for use over a wide temperature range.
- Excellent shear stability and thermal stability for extended fluid service life capability.
- Separates readily from water to allow draining of water from systems.
- Premium protection against rust and corrosion for harsh environments.
- Excellent foam control for dependable performance.
- Provides outstanding anti-wear protection to pumps, motors, and other hydraulic circuit components.
- Recommended for use in Hitachi excavators with 4,000 hour service intervals.



Denison TSCM Test at Various Pressures

Pressure, bar	Overall Efficiency Gain over ISO 46 Monograde, %
15	~2.5
50	~3.5
100	~4.5
150	~6.0
200	~7.5
250	~13.0

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Overview

Applications

Features and Benefits

Properties

CITGO LUBRICANTS

CITGO HyDurance AW Super NZ Fluid

**APPLICATIONS**

- Designed for increased hydraulic efficiency and excellent service life in vane, piston, and gear pumps, when used in accordance with equipment manufacturer recommendations.
- Highly recommended for high-pressure mobile equipment hydraulic systems operating in wide temperature range applications such as mining, construction, and logging.
- Recommended for equipment requiring the following specifications:  
GM LS-2  
Eaton Brochure 03-401-2010  
DIN 51524 PART 3  
U.S. Steel 127, 136, 126  
Cincinnati Machine P-68, P-69, P-70  
Parker Denison HF-0  
Hitachi Excavators

**PROPERTIES**

**Typical Properties for CITGO HyDurance AW Super NZ Fluid**

Material Code	633618001
Gravity, ASTM D4052, °API	31.5
Density, lb/gal	7.23
Flash Point, PM, ASTM D93, °F (°C)	385 (196)
Viscosity ASTM D445	
cSt at 40°C	53.0
cSt at 100°C	9.9
Viscosity Index, ASTM D2270	177
Brookfield Viscosity ASTM D2983	
cP at -30°C	7,998
cP at -40°C	36,392
Pour Point, ASTM D97, °F (°C)	-49 (-45)
Color	Blue
Copper Corrosion, ASTM D130, 3h at 100°C	1A
Rust Test, ASTM D665 A, B	Pass
Four Ball Wear, ASTM D4172, at 40 kg, mm	0.50
Foam Test, ml, ASTM D892	
Sequence I	10-0
Sequence II	25-0
Sequence III	0-0
Water Separability @ 130F, ASTM D1401	40-40-0
Acute aquatic toxicity (LC-50) per OECD TG 203	Pass

**Notes:** Contamination with other fluids can affect environmental benefits and system performance. Contamination with zinc containing and/or emulsifiable fluids may cause foaming, premature filter saturation, and a decrease in water separability. Refer to equipment owner's manual for proper lubricant selection.

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# Product Application Sheets

**PRODUCT INFORMATION SHEET**

**CITGO® CITCOOL® SS-HD**

**CITGO LUBRICANTS**

**OVERVIEW**

- CITGO CITCOOL SS-HD is a water extendable semi-synthetic coolant recommended for heavy-duty applications. The product is suitable for job shops where one coolant is needed to machine a variety of metals in multiple operations.

**FEATURES & BENEFITS**

- Forms stable emulsions in various water hardness up to 1000ppm
- Low foaming tendencies
- Medium oil content
- Free of chlorine, secondary amines, phenols, nitrates, PCB's, and heavy metals
- Product performance is constant and machine remains clean
- Reliable in-service performance and long sump life
- Heavy-duty machining capability
- Ease of disposal and friendly work environments

**APPLICATIONS**

- CITGO CITCOOL SS-HD is recommended for general machining including thread cutting and forming, deep hole drilling and boring, reaming, and grinding of cast irons, ferrous alloys and stainless steels, free cutting aluminum alloys, oil resistant plastics, and other non-ferrous materials.

**Material Compatibility**

Material	Recommended	Highly Recommended
Al - Steels	Yes	Yes
M - Stainless Steel	Yes	Yes
Cast Irons	Yes	Yes
Al - Non-ferrous*	Yes	Yes

\*Might stain some sensitive aluminum alloys, e.g. 2000 and 7000 series

**Refractometer Chart**

Refractometer Reading at 10% = 6.8 °Sic  
Refractometer F factor = 1.47

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Overview

Properties

Features and Benefits

Applications

**CITGO LUBRICANTS**

**CITGO CITCOOL SS-HD**

**PROPERTIES**

**Typical Properties for CITGO CITCOOL SS-HD:**

Material Code	639335001
Appearance, Concentrate (neat)	Amber Fluid
Dilution (5% in DI water)	Semi-Transparent
Gravity, Specific, ASTM D1298, 60/60°F	1.02
Mineral Oil Content %	20
pH at 3% concentration	9.5 (5%)
Defoaming mL (5% in 50 ppm water)	Nil (60 sec.)

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**METAL MACHINABILITY GROUPS<sup>(1)</sup>**

	1 Non-Ferrous, Soft Metals <sup>(2)</sup>	2 Nickel Alloys, Nitralloy Steels, Cast Irons and Alloy Steels (up to 200 Brinell)	3 Stainless Steels, "Monel" Metals, Cast Irons and Alloy Steels (200 to 300 Brinell)	4 Titanium Alloys, High Tensile Nickel Alloys, Austenitic Stainless Steels, Tool Steel and High Tensile Alloy Steels (300 to 400 Brinell)
<b>Machining Operation</b>				
Turning, Boring, Milling, Forming, Drilling, Sawing	5-7%	5-7%	8-10%	8-10%
Tapping, Thread Rolling, Reaming, Screw Cutting, Broaching	5-7%	5-7%	8-10%	8-10%
Gear Shaping, Form and Thread Milling, Shaving, Hobbing, and Trepanning	5-7%	5-7%	8-10%	8-10%
Internal and External Grinding, Form and Thread Grinding	5-7%	5-7%	5-7%	5-7%
Stamping	5-20%	5-20%	5-20%	5-20%

**Notes:** (1) Dilution ratios shown are approximate and may require higher or lower water concentrations depending on a number of factors including the type of metal cut, machine speed, the severity of the operation, metal hardness, etc.  
(2) CITCOOL SS-HD might stain sensitive aluminum alloys such as 2000 and 7000 series alloys.

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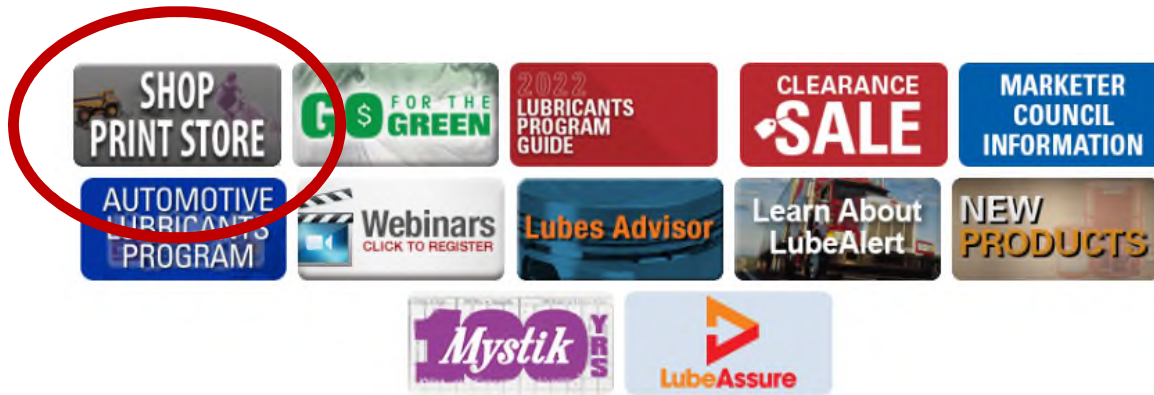


## Product Information Sheets – Key Tests

- Viscosity
- Density/Gravity
- Flash Point
- Pour Point
- Appearance/Color
- Performance Properties
- Grease Consistency (Penetration)
- Grease Dropping Point



# How Do I Get the New Product Guides?







## Questions

- Please post your questions using the Q&A function.
-



## How to Contact Us

- Lubes Answer Line

**800-248-4684**

8:00 AM - 12:00 PM, 1:00 PM – 5:00 PM CT  
Monday through Thursday

8:00 AM - 12:00 PM, 1:00 PM – 4:30 PM CT  
Friday

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## Future Webinars

September 2, 2022	Fundamentals of Lubrication
September 16, 2022	Transmission and Drive Train Lubricants
October 7, 2022	CITGO Metalworking Fluids
October 21, 2022	Clarion Lubricants
November 11, 2022	CITGO Stationary Gas Engine Oils
December 2, 2022	Wireline Lubricants
December 16, 2022	Industrial Gears and Gear Lubrication

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