



# HDAX 9200 LOW ASH GAS ENGINE OILS

Advanced protection for today's 4-cycle stationary gas engines



## HDAX<sup>®</sup> 9200 Low Ash Gas Engine Oil is Chevron's best gas engine oil for protecting modern 4-cycle stationary gas engines

Based on Chevron's proprietary additive technology, this premium oil satisfies the demands of gas engines with a high brake mean effective pressure (BMEP) requiring the oil to withstand high internal pressures while maintaining sufficient film thickness to protect pistons, liners and critical components. HDAX 9200 Low Ash Gas Engine Oil was designed in consultation with major OEMs and was subjected to multiple field tests to meet OEM approval requirements.

### Formulated to fight deposits and help extend drain intervals

Modern high BMEP engines tend to accumulate deposits on the power assemblies (pistons, piston rings, valves, springs, connecting rods and other components). HDAX 9200 Low Ash Gas Engine Oil helps to control these deposits and works to minimize valve recession and spark plug fouling. Additionally, it is formulated with a low level of phosphorus to help protect the catalyst and is robust enough to give operators the ability to extend oil drain intervals.<sup>1</sup>

### Proven performance with major OEMs including: Caterpillar, MWM, GE Jenbacher, Waukesha

HDAX 9200 Low Ash Gas Engine Oil is a proven performer in protecting vital components and bearings in reciprocating engines.



## HDAX 9200 Low Ash Gas Engine Oil is approved for:

- + Caterpillar Energy Solutions GmbH for CG132, CG170 & CG260 gas engines
- + GE Jenbacher Type 3 All Versions, 4A, 4B, 4C, 6 All Versions including F, G, H burning Class A fuel (natural gas)
- + MWM TCG Series burning natural gas
- + MTU preliminary approval MTL 5074 for Series 4000 gas engines<sup>2</sup>
- + RMB/Energie burning natural gas
- + Waukesha VGF & VGP series burning natural gas



Caterpillar G3516 TALE E+ valve springs at end of Approval Test (8,089 hours)

<sup>1</sup> Always follow OEM recommendations. Chevron encourages the use of the Chevron LubeWatch<sup>®</sup> Oil Analysis Program when evaluating the opportunity to extend oil drain intervals.

<sup>2</sup> Preliminary approval received from MTU to carry out field test. On successful conclusion of the field test, the oil will be approved for use in MTU gas engines and will be included in the Fluids and Lubricants Specification.

### Protects across the high-load to low-load spectrum

While a number of OEMs recommend operating their engines with a minimum 83% to 100% load, customers often de-rate their engines below these recommendations to as low as 50%. Operating at these levels can cause inadequate cylinder pressures and interferes with the engine's ability to provide a full, continuous flow of oil to sufficiently lubricate critical engine parts. This also may allow oil to leak past the piston rings into the combustion chamber, which can cause deposits. HDAX® 9200 Low Ash Gas Engine Oil contains robust additive chemistry that helps minimize deposits.

### Meets the demands of the latest engine designs

Many OEMs have implemented design changes on their engines to increase specific output, improve efficiency and reduce emissions. One modification is a steel piston design. Steel pistons allow for higher internal combustion pressures and often include a smaller crown surface area, reduced top land height and a top groove that's moved closer to the combustion space. These changes have resulted in higher temperatures and faster thermal and oxidative breakdown of the lubricant, which may contribute to ring sticking and/or deposit formation, which may lead to increased mechanical stress, and shorter drain intervals. HDAX 9200 Low Ash Gas Engine Oil is formulated to maintain its stability under the harsh conditions brought on by these modern engine designs.

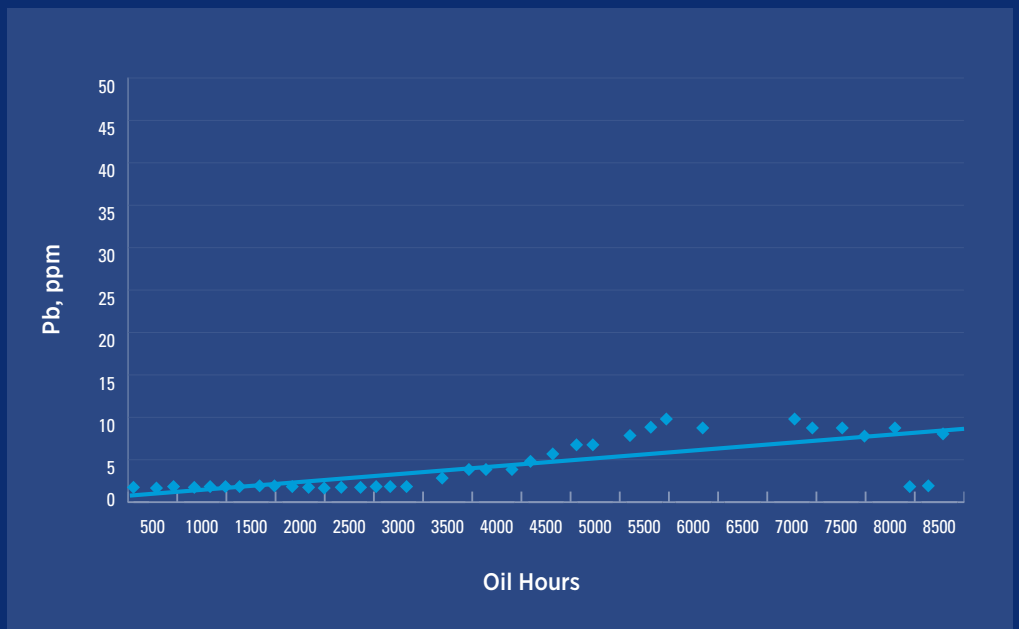


WMM TCG 2016 piston at end of Approval Test showing minimal deposit formation (9,644 hours)



GE Jenbacher 6F piston at end of Approval Test (8,839 hours)

## Caterpillar G3516 TALE E+ Field Test: Wear Elements (Lead)





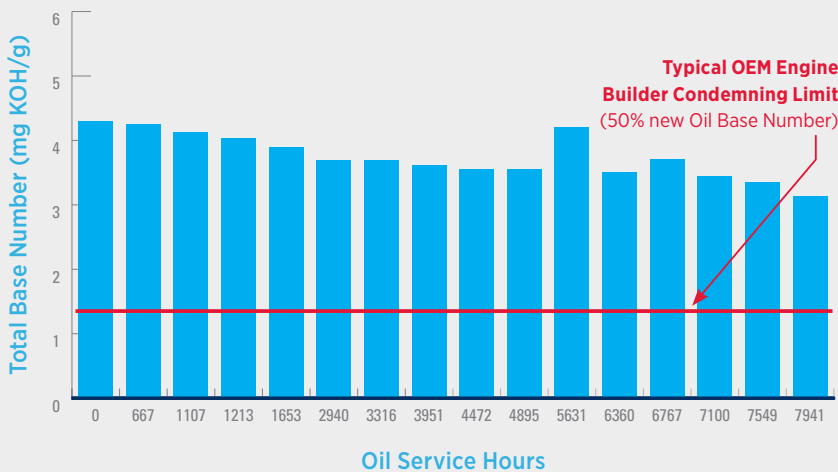
### Slower depletion means greater corrosion prevention

When fuel is burned, the combustion process creates acids that aggressively attack metal surfaces. The best defense against these acids is the alkaline reserve in the engine oil. Thus it is very important to formulate engine oils with sufficient alkaline reserve to neutralize acids before they can cause corrosion.

Base Number (BN) is used to indicate an engine oil's alkaline reserve. Many OEMs have established an engine oil condemning limitation of 50% of new oil BN or Total Base Number (TBN), based on ASTM D 2896. An engine oil with a high initial BN does not necessarily predict the actual longevity of the alkaline reserve or the rate of depletion. Many competitive engine oils advertise high BN numbers, but the alkalinity reserve actually deplete rapidly. HDAX® 9200 Low Ash Gas Engine Oil is formulated with a typical BN of 4.2 mgKOH/g, which may be lower than some of our competitors' top engine oils. However, it consistently depletes at a slower rate, remaining active to help prevent harmful acids from damaging your engine.



### Caterpillar G3606 Field Test: D2896 Base Number (mg KOH/g)



### Get reliability where you need it most

#### Chevron HDAX 9200 Low Ash Gas Engine Oil can help you run better longer

When you're protecting your engines, you're protecting the heart of your business. Chevron HDAX 9200 Low Ash Gas Engine Oil helps you do just that. It is formulated for the latest engine designs, protecting them against deposits, corrosive acids, lubricant depletion and shortened drain intervals.

Chevron specialists can combine our products and targeted services to design a lubrication plan that helps your equipment, and your operation, run better longer.



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