specialised lubricants & fluids for the **power generation** sector

AZTEC OILS
THE LUBRICATION SPECIALISTS

Produced in the UK
DEVELOPING & SUPPLYING QUALITY LUBRICANTS
30 YEARS
1995 · 2025

power generation

Aztec Oils offer a full range of products for the power generation sector, our products are exhaustively tested **to meet and exceed the requirements of the latest OEM specifications.**

We design our products to maintain optimal performance and ensure maximum protection over extended operating periods.

EMPROTEC GEO optimal performance heavy duty gas engine oils for stationary and proprietary generators operating on natural gas, biogas, sewage gas or landfill gas.

EMPROTEC heavy-duty engine oils are perfect to use in smaller petrol and diesel generators, incorporating specialist Adaptive Molecular Technology to enhance the power and efficiency of engines to help maintain peak reliability, performance, and emission compliance in even the harshest of environments.

COOLSPEC winter antifreeze and summer coolants. All engines, especially gas engines, create large amountsof heat during the combustion process. To prevent break downs and overheating, coolants are required to control engine operating temperatures and to carry away excessive heat.

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gas types

Fuel gases are composed of energy-bearing components that drive the combustion process, like all fuels, they often contain impurities and contaminants that can significantly impact engine reliability and operating efficiency. Understanding and selecting the right fuel gas characteristics is critical to ensuring stable and efficient engine operation.

Several fuel properties influence combustion quality and engine behaviour, including:

- Knock resistance
- Fuel calorific value
- Combustion temperature
- Flame speed
- Ignition characteristics

In petrol-fuelled engines, the air/fuel mixture is ignited at a precise point using a spark. However, pockets of fuel may sometimes ignite uncontrollably, leading to engine knock. If persistent, this can cause serious mechanical damage or engine failure.

While petrol uses the octane number to indicate knock resistance, gaseous fuels are rated using the Methane Number (MN).

- Natural gas typically has a lower methane number, which provides better knock resistance.

- Biogas, landfill gas, and sewage gas often exhibit a higher methane number, increasing the risk of uncontrolled combustion and knocking.

Methane is the primary energy contributor in most fuel gases and plays a critical role in combustion due to its high calorific value. However, fuel gases are not composed solely of methane as they may also contain:

Other combustible gases:
- Hydrogen
- Propane
- Butane

Inert gases:
- Nitrogen (N_2)
- Carbon dioxide (CO_2)

These varying components influence not only the energy content of the gas but also its combustion behaviour, efficiency and risk of knock or deposit formation.

While fuel gas composition and quality can vary significantly, modern engine management systems offer the flexibility to compensate for many of these fluctuations. However, as gas quality degrades or contaminant levels rise, the reliability, efficiency, and service life of both the engine and its lubricating oil can be dramatically reduced —especially if these changes go unmonitored.

Contaminants differ depending on the gas source but often include:

- Hydrogen sulphide (H_2S)
- Sulphur compounds
- Chlorine and fluoride compounds
- Silicon-based compounds

These impurities are especially prevalent in gases such as landfill, biogas, and sewage gas.

There is a direct correlation between lower fuel value and higher gas consumption. This increased consumption leads to a higher intake of contaminants, accelerating wear and reducing the effectiveness of the oil.

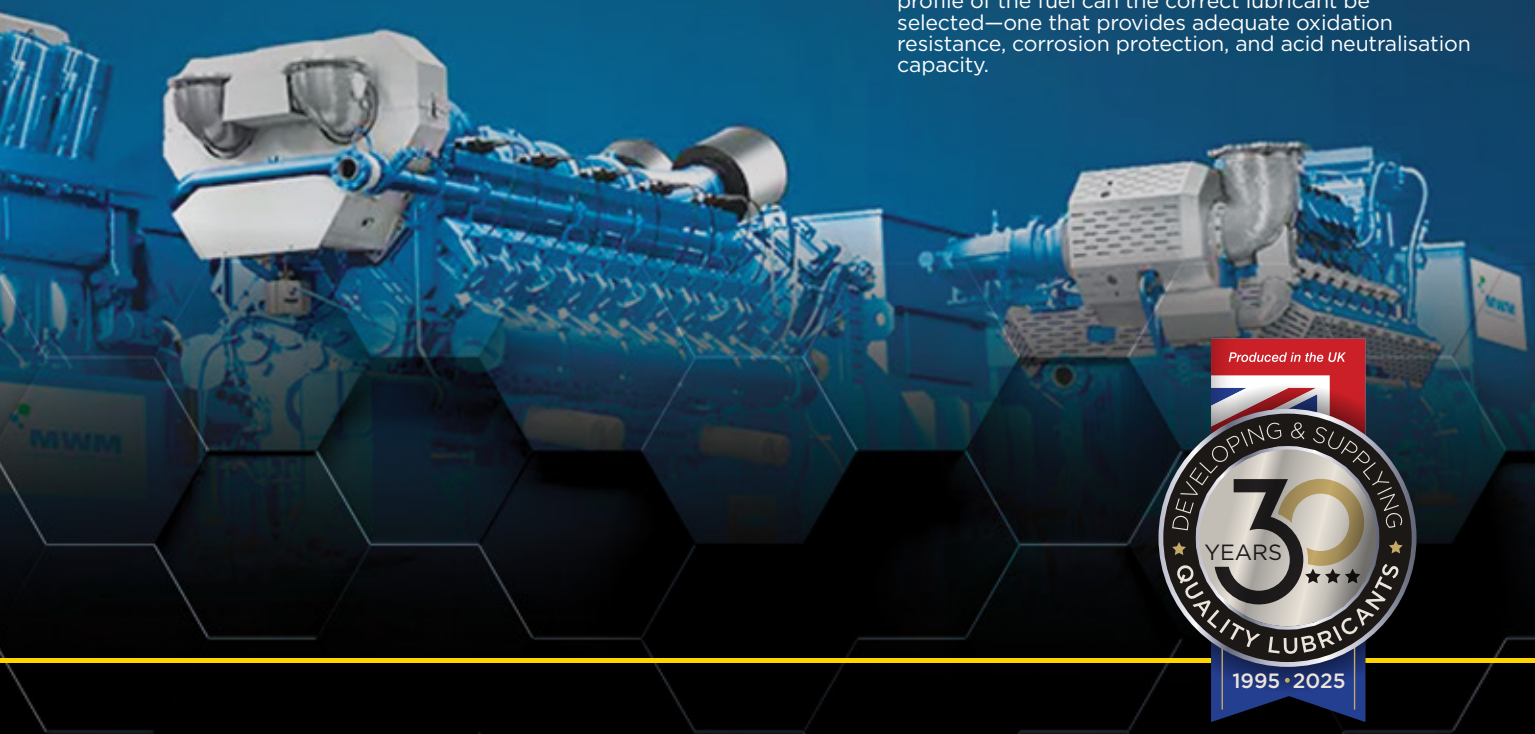
In particular Sulphur compounds can:

- Promote oxidation
- Rapidly deplete the lubricant's acid neutralisation capacity (Total Base Number)
- Increase the formation of corrosive by-products

If not addressed, these effects can compromise both the engine's mechanical integrity and the lubricant's protective function, resulting in shorter oil drain intervals and higher maintenance costs.

To ensure optimal protection and performance, gas engine oils must be carefully formulated to meet the specific challenges posed by the gas type in use. This is why it is critical to identify and monitor the composition of the fuel gas being supplied to the engine.

Only by understanding the chemical and contaminant profile of the fuel can the correct lubricant be selected—one that provides adequate oxidation resistance, corrosion protection, and acid neutralisation capacity.



selecting the right gas engine oil

Choosing an appropriate gas engine oil can be complex, particularly due to the varying requirements of different gas types and engine designs. Gas engine manufacturers specify different sulphated ash limits based on the fuel type.

For engines running on low-contaminant gases (e.g., natural gas or biogas with minimal impurities), manufacturers typically recommend low ash engine oils. These oils prioritise engine cleanliness over acid neutralisation capacity, helping maintain optimal performance and preventing harmful deposits in combustion and exhaust systems.

Conversely, engines that operate on high-contaminant gases (such as landfill or sewage gas) benefit from oils with a higher sulphated ash content. In these applications, the focus shifts toward greater acid neutralisation capacity, which allows for extended oil drain intervals and better protection against corrosive wear.

Understanding Sulphated Ash

Sulphated ash is a by-product formed from metallic additives in lubricating oils. These compounds significantly influence:

- Engine cleanliness
- Acid neutralisation capacity
- Oxidation resistance
- Anti-wear performance

One key additive is Zinc Dialkyldithiophosphate (ZDDP), a common source of zinc. ZDDP offers excellent anti-wear, anti-corrosion, and anti-oxidation properties. However, if it enters the combustion chamber—typically by passing the piston rings—it combusts and forms ash deposits. Metallic compounds based on calcium and magnesium used as detergents and dispersants also contribute to the ash content.

Ash deposits can be abrasive, contributing to:

- Accelerated wear of engine components
- Fouling of the piston ring and groove
- Cylinder liner polishing
- Reduced engine performance
- Premature engine failure

Over time, this abrasive action can grind and smooth the cylinder liner surfaces, diminishing oil film retention and reducing engine lifespan.

Modern engine oils contain detergents and dispersants, these additives help:

- Neutralise combustion acids
- Disperse soot and sludge, maintaining internal cleanliness
- Aid in minimising ash deposits on pistons and rings

The Total Base Number (TBN) of an oil indicates its capacity to neutralise acids. Higher TBN values reflect greater protection against corrosion from acidic by-products.

Striking the Right Balance

Advanced lubricant formulations aim to balance engine cleanliness, robust acid neutralisation and wear protection. This requires a synergistic approach to additive design. Oils with higher levels of detergents and ZDDP provide:

- Improved wear protection
- Enhanced oxidation stability
- Extended oil drain intervals

However, these benefits come at the cost of increased sulphated ash formation, which must be managed depending on engine type and fuel source.

GAS ENGINE OILS		RECOMMENDED BY AZTEC OILS FOR THE FOLLOWING APPLICATIONS: (* APPROVALS)
GEO001	**EMPROTEC GEO NBG-L 40** SA = 0.5% | TBN = 5.7	Caterpillar G3516 Tale engines; Cummins QSK60S; INNIO Jenbacher Type 2, 3, 4 (versions A&B), Type 6 (versions C&E) Natural Gas (Class A)*; INNIO Jenbacher Type 2, 3, 4 (versions A&B), Type 6 (versions C&E) Biogas (Class A)*; MAN M 3271-2; MWM Natural Gas, MWN Biogas; Rolls-Royce B35:40, C26:33, K-G1/G2/G3/G; Wärtsilä SG34, SG50; Approved for use in MWM TCG & Caterpillar CG engines*.
GEO002	**EMPROTEC GEO BLG-L 40** SA = 0.56% | TBN = 5.7	Caterpillar C Series engines; INNIO Jenbacher Type 2, 3, 4 (versions A&B), Type 6 (versions C&E) Biogas (Class A)*; INNIO Jenbacher Type 2, 3, 4 (versions A&B), Type 6 (versions C&E) Landfill Gas (Class C)*; MAN M 3271-4, M 3271-5 (Special Gas); MWN Special Gas; Approved for use in MWM TCG & Caterpillar CG engines*.
GEO003	**EMPROTEC GEO BLG-M 40** SA = 0.8% | TBN = 8.0	INNIO Jenbacher Type 2, 3, 4 (versions A&B), Type 6 (versions C&E) Natural Gas (Class A); INNIO Jenbacher Type 2, 3, 4 (versions A&B), Type 6 (versions C&E) Biogas (Class A); MWN Biogas;
GEO004	**EMPROTEC GEO NBG-M 40** SA = 0.8% | TBN = 8.0	Suitable to use in power generation plants where a mid-ash content (0.5-1%) is accepted by the manufacturer or stationary gas engines operating on sour gases (natural, sewage & biogas).
FULLY SYNTHETIC, LOW ASH GRADES FOR DIESEL GENERATORS		
HDD045	**EMPROTEC ULTRA 5W-30 LA**	ACEA E7/E8/E11; API SN/CK-4; JASO DH-2; Caterpillar ECF-3; Cummins CES 20086; DAF PSQL 2.1E-LD; Daimler Trucks DTFR 15C120 (MB 228.52), DTFR 15C110 (MB 228.51), DTFR 15C100 (MB 228.31); Detroit Diesel DDC 93K222; Deutz DQC IV-18 LA; Ford WSS-M2C213-A1; Mack EOS-4.5; MAN M3775, M3677; MTU Type 3.1; Renault Trucks RLD-3; Scania LDF-4; Volvo VDS-4.5*; *Can be used where Volvo VDS-5 is required with the exception of potential fuel economy benefits.
HDD046	**EMPROTEC ULTRA 10W-40 LA**	ACEA E7/E8/E11; API CK-4; JASO DH-2; Caterpillar ECF-3; Cummins CES 20086; DAF PSQL 2.1E-LD; Daimler Trucks DTFR 15C120 (MB 228.52), DTFR 15C110 (MB 228.51), DTFR 15C100 (MB 228.31); Deutz DQC IV-18 LA; Mack EOS-4.5; MAN M3775; MTU Type 3.1; Renault Trucks RLD-3; Volvo VDS-4.5;
HDD041	**EMPROTEC ECO 5W-30 LA**	ACEA E7, E8, E11; API SN/CK-4; Cummins CES 20086, CES 20081; Daimler Trucks DTFR 15C110 (MB 228.51), DTFR 15C100 (MB 228.31); Deutz DQC IV-18 LA; JASO DH-2; Mack EOS-4.5; MAN M3775, M3677; Renault RLD-3, RGD; Volvo VDS-4.5, VDS-4; Suitable for DAF.
HDD008	**EMPROTEC EURO 10W-40 LA**	ACEA E7, E8, E11; API SN/CK-4; Cummins CES 20086, CES 20081; Daimler Trucks DTFR 15C110 (MB 228.51), DTFR 15C100 (MB 228.31); Deutz DQC IV-18 LA; JASO DH-2; Mack EOS-4.5; MAN M3775, M3477; Renault RLD-3, RGD; Volvo VDS-4.5, VDS-4; Suitable for DAF.
GROUP II, MID ASH GRADES FOR DIESEL GENERATORS		
HDD049	**EMPROTEC UHPD-X 10W-30 FE**	ACEA E7/E11; API SP/CK-4, CJ-4; China D1; JASO DH-2; Allison TES 439; Caterpillar ECF-3; Cummins CES 20100, 20087, 20086; Daimler Trucks DTFR 15C100 (MB 228.31); Detroit DDC93K222; Deutz DQC III-18 LA; Ford WSS-M2C171-F1; Mack EOS-4.5; MAN M3775; MTU Type 2.1; Renault Trucks RLD-3; Volvo VDS-4.5;
HDD050	**EMPROTEC UHPD-X 10W-40**	ACEA E7/E11; API SP/CK-4, CJ-4; China D1; JASO DH-2; Allison TES 439; Caterpillar ECF-3; Cummins CES 20100, 20087, 20086; Daimler Trucks DTFR 15C100 (MB 228.31); Detroit DDC93K222; Deutz DQC III-18 LA; Mack EOS-4.5; MAN M3775; MTU Type 2.1; Renault Trucks RLD-3; Volvo VDS-4.5;
HDD051	**EMPROTEC UHPD-X 15W-40**	ACEA E7/E11; API SP/CK-4, CJ-4; China D1; JASO DH-2; Allison TES 439; Caterpillar ECF-3; Cummins CES 20100, 20087, 20086; Daimler Trucks DTFR 15C100 (MB 228.31); Detroit DDC93K222; Deutz DQC III-18 LA; Ford WSS-M2C171-F1; Mack EOS-4.5; MAN M3775; MTU Type 2.1; Renault Trucks RLD-3; Volvo VDS-4.5;
HDD053	**EMPROTEC EHPD 10W-30**	ACEA E7/E11; API SN/CK-4; JASO DH-2; Caterpillar ECF-3; Cummins CES 20086, CES 20081; DAF E9; Daimler Trucks DTFR 15C100 (MB 228.31); Detroit DFS 93K222; Deutz DQC III-18 LA; IVECO TLS E9; Mack EO-O Premium Plus; MAN M 3775; MTU Type 2; Renault Trucks RLD-3; Volvo VDS-4.5;
HDD054	**EMPROTEC EHPD 10W-40**	ACEA E7/E11; API SN/CK-4; JASO DH-2; Caterpillar ECF-3; Cummins CES 20086, CES 20081; DAF E9; Daimler Trucks DTFR 15C100 (MB 228.31); Detroit DFS 93K222; Deutz DQC III-18 LA; IVECO TLS E9; Mack EO-O Premium Plus; MAN M 3775; MTU Type 2; Renault Trucks RLD-3; Volvo VDS-4.5;
HDD052	**EMPROTEC EHPD 15W-40**	ACEA E7/E11; API SN/CK-4; JASO DH-2; Caterpillar ECF-3; Cummins CES 20086, CES 20081; DAF E9; Daimler Trucks DTFR 15C100 (MB 228.31); Detroit DFS 93K222; Deutz DQC III-18 LA; IVECO TLS E9; Mack EO-O Premium Plus; MAN M 3775; MTU Type 2; Renault Trucks RLD-3; Volvo VDS-4.5;
MINERAL & SEMI SYNTHETIC GRADES FOR DIESEL GENERATORS		
HDD027	**EMPROTEC SHPD 10W-30**	ACEA E7 (E5); API CI-4, CH-4; Caterpillar ECF-1, ECF-2; Cummins CES 20072, 20076, 20077, 20078; Daimler Trucks DTFR 15B110 (MB 228.3); Deutz DQC III-10; Global DHD-1; Mack EO-N; MAN M3275; MTU Type 2.0; Renault Trucks RLD-2; Volvo VDS-3;
HDD016	**EMPROTEC SHPD 10W-40 SS**	ACEA E7 (E5); API CI-4, CH-4; Caterpillar ECF-1, ECF-2; Cummins CES 20072, 20076, 20077, 20078; Daimler Trucks DTFR 15B110 (MB 228.3); Detroit Diesel 93K215; Deutz DQC III-10; Global DHD-1; Mack EO-N; MAN M3275; MTU Type 2.0; Renault Trucks RLD-2; Volvo VDS-3;
HDD043	**EMPROTEC SHPD-X 15W-40**	ACEA E7 (E5); API CI-4, CH-4; Caterpillar ECF-2, ECF-1; Cummins CES 20072, 20076, 20077, 20078; Daimler Trucks DTFR 15B110 (MB 228.3); Deutz DQC III-10; Global DHD-1; Mack EO-N; MAN M3275; MTU Type 2.0; Renault Trucks RLD-2; Volvo VDS-3; ZF TE-ML 07C;
HDD022	**EMPROTEC SHPD 20W-50**	ACEA E7 (E5); API SL/CI-4; Daimler Trucks DTFR 15B110 (MB 228.3); MAN 271, M3275; Mercedes-Benz 228.1;
HDD003	**EMPROTEC FLEET 15W-40**	ACEA E3; API CH-4; Caterpillar ECF-1; Cummins CES 20072; Deutz DQC II-10; Mack EO-L; MAN 271; Mercedes-Benz 228.1; MTU Type 1.0; Volvo VDS-2;

EMPROTEC GEO heavy-duty gas engine oils are engineered for optimal performance in stationary and proprietary generators operating on natural gas, biogas, or landfill gas. **EMPROTEC** heavy-duty engine oils are ideal for petrol and diesel generators, featuring advanced Adaptive Molecular Technology to maintain peak engine power and efficiency. This ensures maximum reliability, consistent performance and emission compliance, even in the most demanding environments.

CoolSpec
Coolant Antifreeze

CODE	NAME	TYPE	COLOUR	LIFE	PERFORMANCE LEVELS
WIN006	**COOLSPEC REGULAR IAT CL**	MEG+ IAT	Blue	2 years	ASTM D3306; BS 6580:2010; SAE J 1034; UNE 26-361;
WIN007	**COOLSPEC SUPREME OAT LL**	MEG+ OAT (2-EHA Free)	Red	5 years	ASTM D3306, D4656, D4985, D6210; BS 6580:2010; Chrysler MS 9176; CNH MAT 3624, MAT 3724; Cummins CES 14603, 14439; DAF 74002; Daimler Truck DTFR 29C110; Deutz DQC CB-14; Ford ESD-M97B49-A, WSS-M97B44-D; GM 1899M, 6277M, 3420, B 040 1065; IVECO 18-1830; Jaguar Land Rover STJLR.651.5003; Leyland Trucks LTS 22 AF 10; Mack 014GS 17004; MAN 324 SNF; Mercedes-Benz 325.3; NATO S-759; Opel QL130100; Renault 41-01-001 Type D; Rolls Royce Bergen 2.13.01; SAE J 1034; Volvo VCS; VW Group TL-774 D&F (G12, G12 Plus); UNE 26361-88; Suitable to use where G30, G33 & G34 is specified.
WIN015	**COOLSPEC SUPREME Si-OAT LL**	MEG+ Si-OAT	Lilac/ Pink	5 years	AFNOR NF R15-601; ASTM D3306, D4656, D4985; BS 6580:2010; Cummins CES 14603; Daimler Truck DTFR 29C120; Deutz DQC CC-14; Lieberr Min LH-01-COL3A; MAN 324 Type Si-OAT; Mercedes-Benz 325.5 (conc), 325.6 (premix); Scania TB 1451; VW Group TL-774 G (G12 Plus Plus); UNE 26361-8; Suitable to use where G40, GG40 is specified.
WIN013	**COOLSPEC SUPREME HYBRID HD**	MEG+ H-OAT (2-EHA Free)	Green	3 years	AFNOR NF R15-501; ASTM D2206, D4985, D6210; BS 6580:2010; BR 637 (except for colour); Caterpillar EC-1; Chrysler MS 9769; Cummins CES 14603; Daimler Trucks DTFR 29C100; JCB STD00088 (HD); JIS K 2234; John Deere JDM H24; MAN 324N; Mercedes-Benz 325.0; MTU (MTL) 5048; NATO S-759; SAE J 1034; UNE 26-361; Suitable to use where G05 is specified.
WIN041	**COOLSPEC SUPREME P-OAT AK**	MEG+ P-OAT (2-EHA Free)	Blue/ Green	5 years	ASTM D3306, D4645; BS 6580:2010; Ford WSS-M97B57-A1; Honda Type 2; JIS K 2234; Mazda FL22; Mercedes-Benz 325.7; Nissan L255N; Renault/Nissan/Dacia RNES 41-01-001; PSA B 71 1111; SAE J 1034; Stellantis MS.50203; Subaru 16218; Toyota TSK 2601G-8A; Suitable for asian vehicle manufacturers including Hyundai, KIA, Komatsu, Mitsubishi & Suzuki
WIN045	**COOLSPEC SUPREME PSi-OAT LL**	MEG+ PSi-OAT (2-EHA Free)	Orange	5 years	ASTM D3306, D4656; BS 6580:2010; Chrysler MS 7170; MTU MTL 5048; Scania TB 1451; SAE J 1034; Volvo V CS-2; Volvo TR-31854114-002; VW Group TL-774 L (G12 (G12 EVO); Suitable to use where G64 or G65 is specified. See Technical Data Sheet for full list of specifications.

FOR OPTIMUM PERFORMANCE, DEIONISED OR DEMINERALISED WATER IS PREFERRED FOR DILUTION ALTHOUGH OTHER WATER TYPES CAN BE USED.

COOLSPEC antifreeze coolants are highly effective, versatile and are designed for year-round protection. They maintain optimal engine operating temperatures by efficiently dissipating excess heat, ensuring reliable performance in both extreme cold and intense heat conditions. All engines, particularly gas engines, generate significant amounts heat during the combustion process specifically formulated to manage this heat effectively, helping to prevent overheating, breakdowns, and engine damage.

oil change intervals & condition monitoring

Whilst oil change intervals are initially based on the engine manufacturer's recommendations, they should be fine-tuned through routine oil analysis to reflect real-world operating conditions. Each engine may require an individualised oil change schedule, depending on a range of variables.

Key factors influencing optimum oil drain intervals include:

- Fuel gas quality
- Lubricating oil formulation
- Environmental conditions
- Engine load and operating mode

Regular oil sampling and analysis is essential for tracking lubricant degradation, detecting changes and assessing remaining oil life. It also provides valuable insights into the internal health of the engine, helping to identify early signs of wear or contamination.

By proactively monitoring oil condition, operators can prevent engine damage, minimise downtime, and reduce repair costs, ensuring optimal engine reliability and performance over time.

want to know more?

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Go to www.aztecoils.co.uk and enter your equipment details to find out which products are most suitable...

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AZTEC OILS
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Aztec Oils on hand to support you

Aztec Oils are proud to offer premium levels of assistance to all our customers. We have a dedicated Technical Support team on hand to offer guidance on the correct use of our products.

Our expert team in our on-site laboratory continually test the quality and compliance of all our lubricants so our customers know that Aztec Oils is a brand they can trust.

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THE LUBRICATION SPECIALISTS

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Produced in the UK

DEVELOPING & SUPPLYING 30 YEARS QUALITY LUBRICANTS

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